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# CANADIAN GEOGRAPHICAL JOURNAL

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Superintendent HENRY ASBJORN LARSEN
ROYAL CANADIAN MOUNTED POLICE
*Recipient of the Society's Massey Medal*

Published by THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY

# THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY

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The Society's ambition is to make itself a real force in advancing geographical knowledge, and in disseminating information on the geography, resources and people of Canada. In short, its aim is to make Canada better known to Canadians and to the rest of the world.

As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography — historical, physical and economic — of Canada, of the British Commonwealth and of the other parts of the world. It is the intention to publish articles in this magazine that will be popular in character, easily read, well illustrated, and informative.

The Canadian Geographical Journal will be sent to each member of the Society in good standing. Membership in the Society is open to any one interested in geographical matters. The annual fee for membership is five dollars (Canadian currency).

The Society has no political or other sectional associations, and is responsible only to its members. All money received is used in producing the Canadian Geographical Journal and in carrying on such other activities for the advancement of geographical knowledge as funds of the Society may permit.

Royal Bank manager picks up pointers on fertilizer manufacturing

## What's a Banker Doing at the Plant?

The Royal Bank manager (on the right) has the right formula for getting to know his customer's business better. A visit to his customer's plant won't make him an expert on fertilizers, but it will give him a closer insight into the workings of the industry... provide background for a more informed banking service. This habit of seeking information in the field is typical of Royal Bank managers everywhere... one reason why the Royal stands so high at home and abroad and why it is Canada's largest bank.

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### *New Honorary President*

Major-General H. A. Young, President of the Society, has announced that the Right Honourable Vincent Massey, C.H., has accepted the appointment of Honorary President of the Society. He succeeds Mr. Charles G. Cowan who retires this year.

Since June 1952 Mr. Massey had been Honorary Patron of the Society, a position he vacated upon relinquishing the office of Governor General.

Mr. Massey has taken a great interest in the work of the Society. In 1957 he delivered a stimulating address, entitled "Every Man His Own Geographer", at the twenty-eighth Annual General Meeting. He was instrumental in obtaining Her Majesty's permission to incorporate the word "Royal" in the title of the Society.

Mr. Massey once described himself as "one of the keenest students of Canadian geography", and his desire to encourage public interest in this field is exemplified by the establishing of the Massey Medal, the first presentation of which is described elsewhere in this issue.

### *Charles G. Cowan*

The retirement of Mr. Charles G. Cowan brings to an end a long period of exceptional service to the Society.

Mr. Cowan is a charter Corporate Member of the Society. With Dr. Charles Camsell and a small group of dedicated geographers he successfully organized the Canadian Geographical Society in 1929. He was an officer of the Society from 1929 to 1950, serving first as Vice-President and later, after the death of Dr. George J. Desbarats in 1944, as President. In 1950 when he was contemplating retirement from active business life — he was then President of the British American Bank Note Company — he tendered his resignation as President and Director. The following year he was appointed Honorary President of the Society.

*Charles G. Cowan*
National Film Board

# CANADIAN GEOGRAPHICAL JOURNAL

*Published monthly by*

THE ROYAL CANADIAN GEOGRAPHICAL SOCIETY

Ottawa, Ontario


This magazine is dedicated to the presentation in authentic and popular form, with extensive illustrations, of the broad pattern of Canadian life and its industrial, physical, and cultural foundations.


The articles in this Journal are indexed in the *International Index to Periodicals* and in the *Canadian Index.*

The British standard of spelling is adopted substantially as used by the Government of Canada and taught in most Canadian schools, the precise authority being the Concise Oxford Dictionary, fourth edition, 1951.

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Bill Lingard-Photo Features


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# First Presentation of the Society's Massey Medal

ON SATURDAY, September 12th, His Excellency The Right Honourable Vincent Massey, in one of his last official duties as Governor General of Canada, presented the Society's Massey Medal to Superintendent Henry Asbjorn Larsen of the Royal Canadian Mounted Police.

Superintendent Larsen is the first recipient of this distinguished award which was established by the Massey Foundation for annual presentation. He receives the gold medal for his great contribution to the geographical knowledge of Canada.

### Henry Asbjorn Larsen

Henry Asbjorn Larsen was born in Norway and graduated from the Norwegian Polytechnic in navigation. After two early voyages to the western Arctic as mate and navigator, he joined the Royal Canadian Mounted Police in 1928 and was posted for duty aboard the *St. Roch*, of which he became master in 1935. Between 1930 and 1939 he wintered mostly in Coronation Gulf and Cambridge Bay, and from 1940 to 1942 he made the first west to east voyage through the Northwest Passage, spending two winters *en route*. In 1944 he made the first voyage through the Northwest Passage to be completed in a single year. In 1952 he was appointed Officer Commanding "G" Division of the Royal Canadian Mounted Police, including the Northwest and Yukon Territories, whence he carries out frequent inspection trips to isolated detachments by sea and air. He has published full reports of his voyages and patrols.

He is a Fellow of The Royal Canadian Geographical Society, a Fellow of the Arctic Institute of North America and an honorary member of the Royal Geographical Society. He was awarded the Patron's gold medal by the Royal Geographical Society and he has also been awarded the Polar medal and bar.

### Ceremony at Government House

The presentation took place at Government House, Ottawa, and was attended by Major-General H. A. Young, President of the Society; General A. G. L. McNaughton, Vice-President; Dr. C. J. Mackenzie, Vice-President; Mr. G. F.

Maclaren, Mr. E. S. Martindale, Dr. C. M. Barbeau, Mr. D. M. Coolican, Vice-Admiral H. T. W. Grant, Dr. O. M. Solandt, Dr. J. T. Wilson, Directors of the Society; Major-General W. J. Megill, Executive Secretary and Editor of Publications; Mr. G. M. Dallyn; R.C.M.P. Commissioner C. E. Rivett-Carnac, and Mr. A. B. Beddoe.

**"For Outstanding Personal Achievement . . ."**

The Massey Medal of The Royal Canadian Geographical Society is to be awarded by the Society not more frequently than annually, the award being withheld in a year in which no candidate entirely fulfils the requisite qualifications. It is given "for outstanding personal achievement in the exploration, development or description of the geography of Canada". The words "For outstanding personal achievement" are inscribed on the reverse of the medal.

The medal was designed by Mr. Alan B. Beddoe of Ottawa, who also designed the new Armorial Bearings of the Society. The obverse bears the Shield, Crest and Motto of the Armorial Bearings and the reverse, the device of the Massey Foundation — a hart resting upon the ground in front of a crenellated stone tower.

The medal was specially struck at the Royal Canadian Mint this summer in time for presentation by Mr. Massey before he left his post in September. A close view of the medal shows the clear-cut definition and careful workmanship that has always been a marked feature of Canadian coinage.

*Major-General H. A. Young, the Society's President, Governor General Vincent Massey and Superintendent H. A. Larsen examine the Medal.*

Bill Lingard—Photo Features

*The National Research Council Hydraulics Laboratory at Ottawa has floor space and water storage to accommodate several scale model studies concurrently.*

# The Scale Model—Oracle of the Hydraulics Engineer

by W. J. MACKEY

National Research Council photograph

*In the hydraulic model the forces of nature are kept small and manageable; years of time are telescoped into hours, and with his own eyes man can see the work of ages.*

WHEN the Ancient Greeks wanted to look into the future they went to a cave at Delphi to visit the celebrated Oracle. Today when engineers want to know how water is going to affect their man-made structures they rely on a more scientific oracle — the hydraulic scale model.

Hydraulic models are miniature copies of streams, harbours or dams which research engineers lay out on the floors of their laboratories, complete with running water, waves, and even winds. They have become something of a triumph in applied research. Part computing machine, part crystal ball, such a model, built to scale and adjusted to perform like the real thing, can give straight answers to tricky questions of water behaviour. With scale model techniques predictions are being made for ports, hydraulic projects, river-beds, canal locks and estuaries all over the world; and the predictions are saving millions of dollars of public and private funds. A few weeks in the laboratory is worth years of laborious outside testing and observation.

A dramatic illustration of what can be done with the scale model has come recently from the Seine Estuary in France. The port city of Rouen, a hundred miles inland on the Seine, depends for its life on the navigable channels of the river. These alter considerably with currents, ocean tides, storms and shifting sand-bars; and over many years the changes are profound.

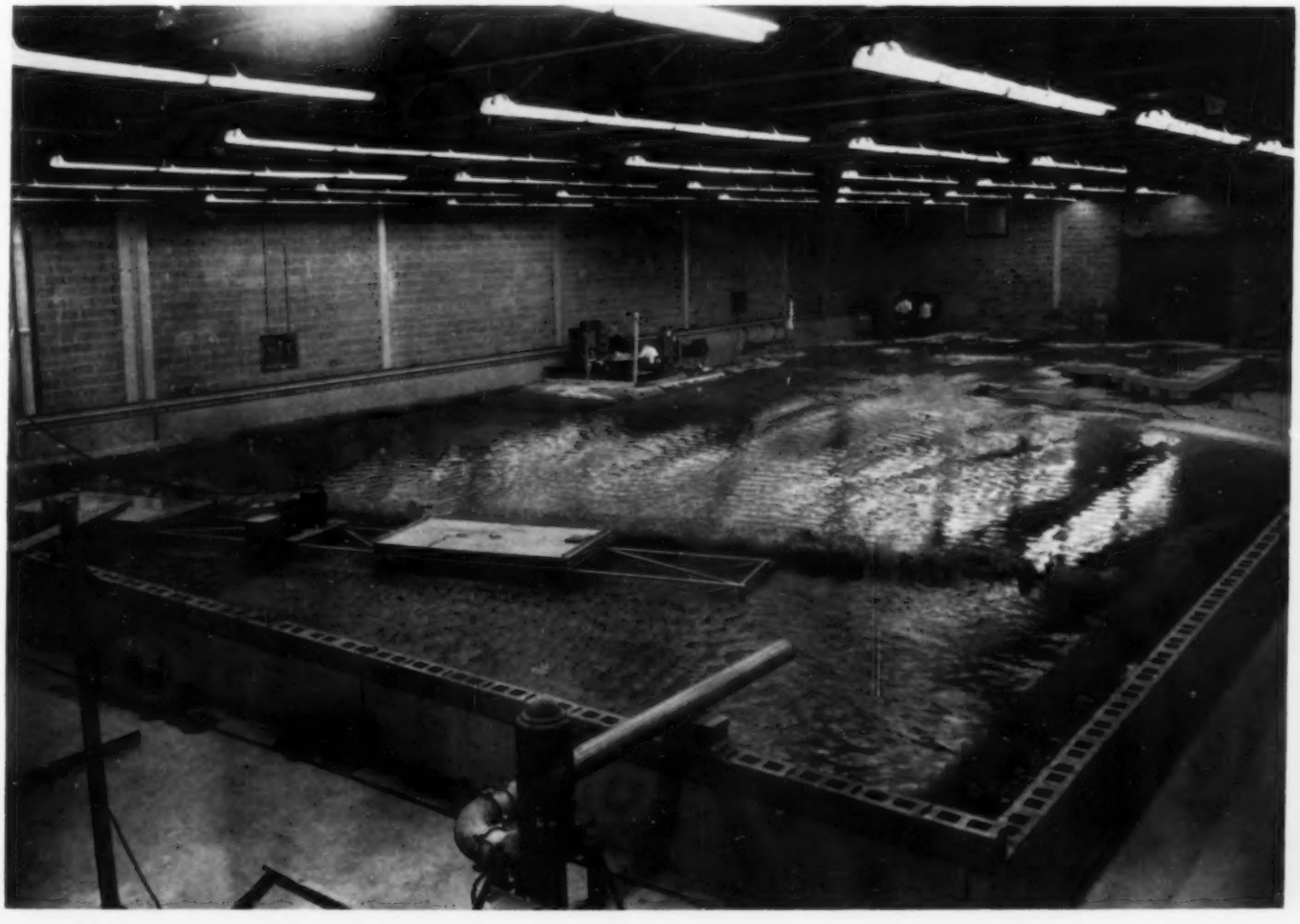
The problem in the Seine was to predict the natural river changes over future years, if possible over the next half century. Dredging channels and retaining banks — expensive operations at best — can be more effective if the work is done in step with nature. The object at Rouen was to back the stream, not buck it.

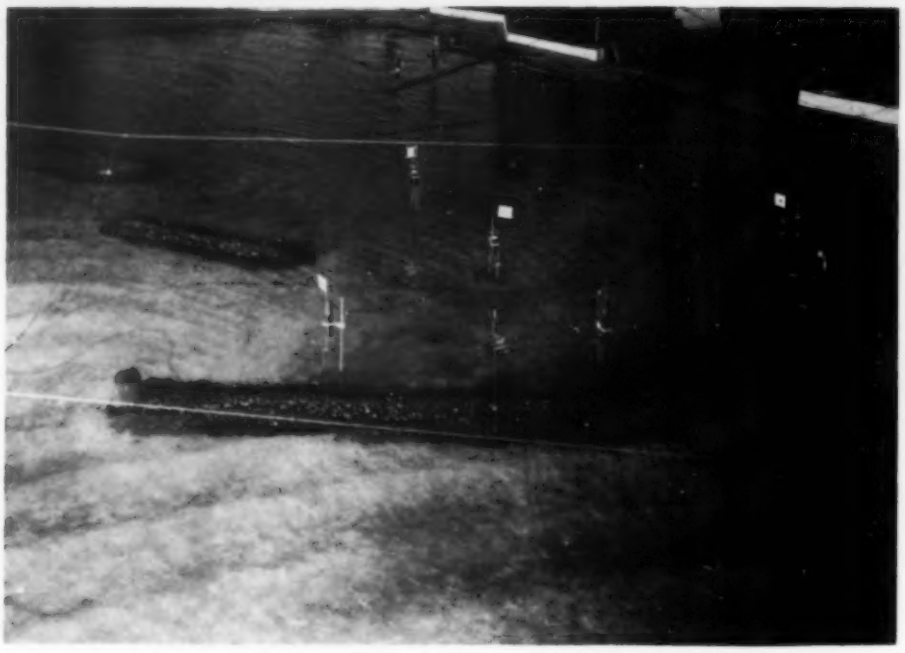
The job of forecasting was taken on by the SOGREAH hydraulic centre at Grenoble, France—one of the most elaborate establishments of its kind in the world, with fifteen acres of hydraulic models and a staff of 500 engineers and technicians. At Grenoble a model of the lower reaches of the Seine was constructed. Accurate records of earlier conditions in the Estuary, which had been compiled for a hundred years or more, were used to "adjust" the model historically. Time and the river were moved back to a period eighty years earlier. That is, the river model was adjusted to the year 1869.

Then the water was allowed to flow. Years of the river's past became days on the model. The tiny sand-bars formed and reformed, the miniature channels shifted. The river-bed changed precisely as the records predicted it would. With surprising accuracy the present condition of the river was reached. This was a satisfactory check on the whole operation. It was also a necessary key to the time scale of the experiment.

The flow continued, and the Seine's future was unveiled. The changes which would take place, decade by decade, to the year 2000 and beyond were observed and dated.

*Scientists at the NRC, Ottawa, using a hydraulic scale model to study wave action in the harbour at Port aux Basques, Newfoundland.*





*Left:—Chandler* coast, Que
*Centre:—Port Cartier,* on the St. L
*Right* va Scotia

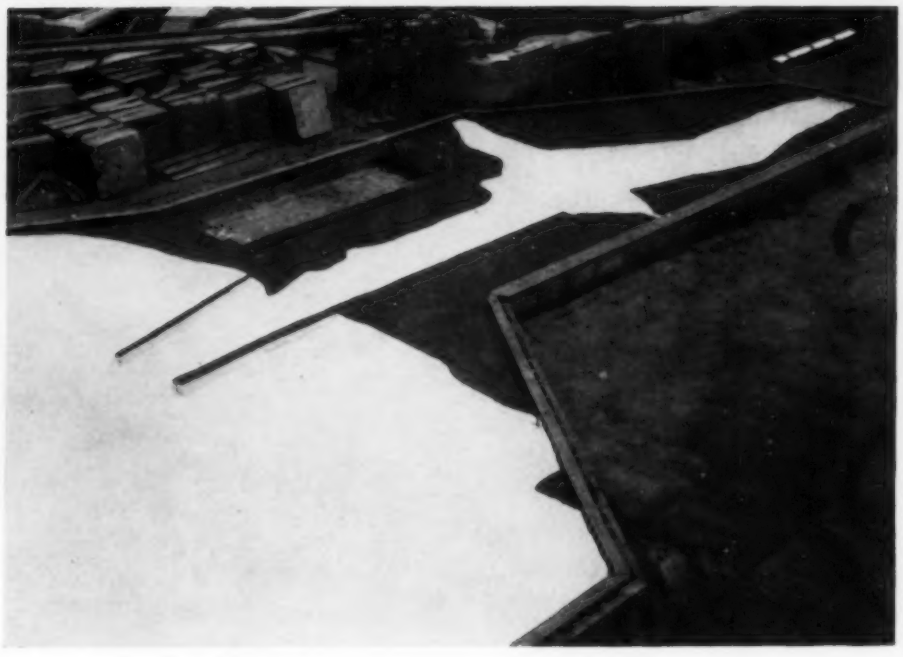
Another classic success story of the hydraulic model, though by no means exceptional, was the work done for the Weser River in Germany. Sixty years ago this river was becoming inaccessible. Seawards from the port city of Bremerhaven navigation was plagued by sandbars, shallow water and the vagaries of the tidal estuary. Model studies of the Weser, begun many years ago, soon upset conventional theories. Instead of concentrating the river flow in order to clear the estuary, the flow was broadened. This opened up the mouth to a deeper penetration of tide-water, and flushed by the daily ebb-tides the estuary was soon cleaned out. From a depth of six feet the harbour deepened itself to about twenty feet. Recently the same treatment has been proposed for the St. Lawrence River below Quebec City.

In Canada a number of hydraulic model studies have been made by the National Research Council, and several more are in draft form. Here again, results have been astonishingly accurate and predictions are confidently made. A recent project carried out for the federal Department of Public Works was to protect the new harbour and ferry wharf at Port aux Basques, Newfoundland. The scale model showed where and how the proposed breakwater ought to be built to provide maximum shelter against rough waters from the open Atlantic.

Just completed is a model study of Chandler Harbour, on the south-east coast of the Gaspé. The problem here resembles that at Port aux Basques: exposure to the sea, with inadequate protection to existing wharves. At the NRC Hydraulics Laboratory at Ottawa engineers built a model of Chandler Harbour to a scale of 1:100. Fifty-three feet of the model represented a mile of the harbour. The model, only 120 feet by 64 feet, with a maximum water depth of twelve inches, was "adjusted" to wave conditions at high tide. Then waves, mechanically generated to the correct scale, were laid on; and the model exactly reproduced the storm effects on wharves and beaches that are experienced at Chandler. One of the effects faithfully duplicated was a heavy harbour current created by waves breaking on an island at the mouth.

Thus built and tested, the model was fitted with experimental breakwaters. As a result, three alternative solutions were recommended, ranging from good to ideal. The choice would depend on how much money was to be spent. Now at the NRC a new model is nearing completion to solve a similar problem of wave action at Glace Bay, Nova Scotia.

The scale model makes its best showing in a unique situation, when something new or out of the ordinary in hydraulics is to be tackled. A case in point is the building of Port Cartier, a new harbour to be constructed west of Seven Islands on the St. Lawrence north shore. Actually, Port Cartier is to be blasted out of solid rock. Instead of outlying wharves and



*dler Coast, Quebec.*
*on the St. Lawrence, Quebec.*
*Nova Scotia.*

breakwaters the design calls for an inshore basin to be excavated, with no outside breakwater. The basin must be so built to protect itself. This will be attempted in two ways — by proper orientation of a short wing or lip at the opening, and by correct treatment of the basin inside.

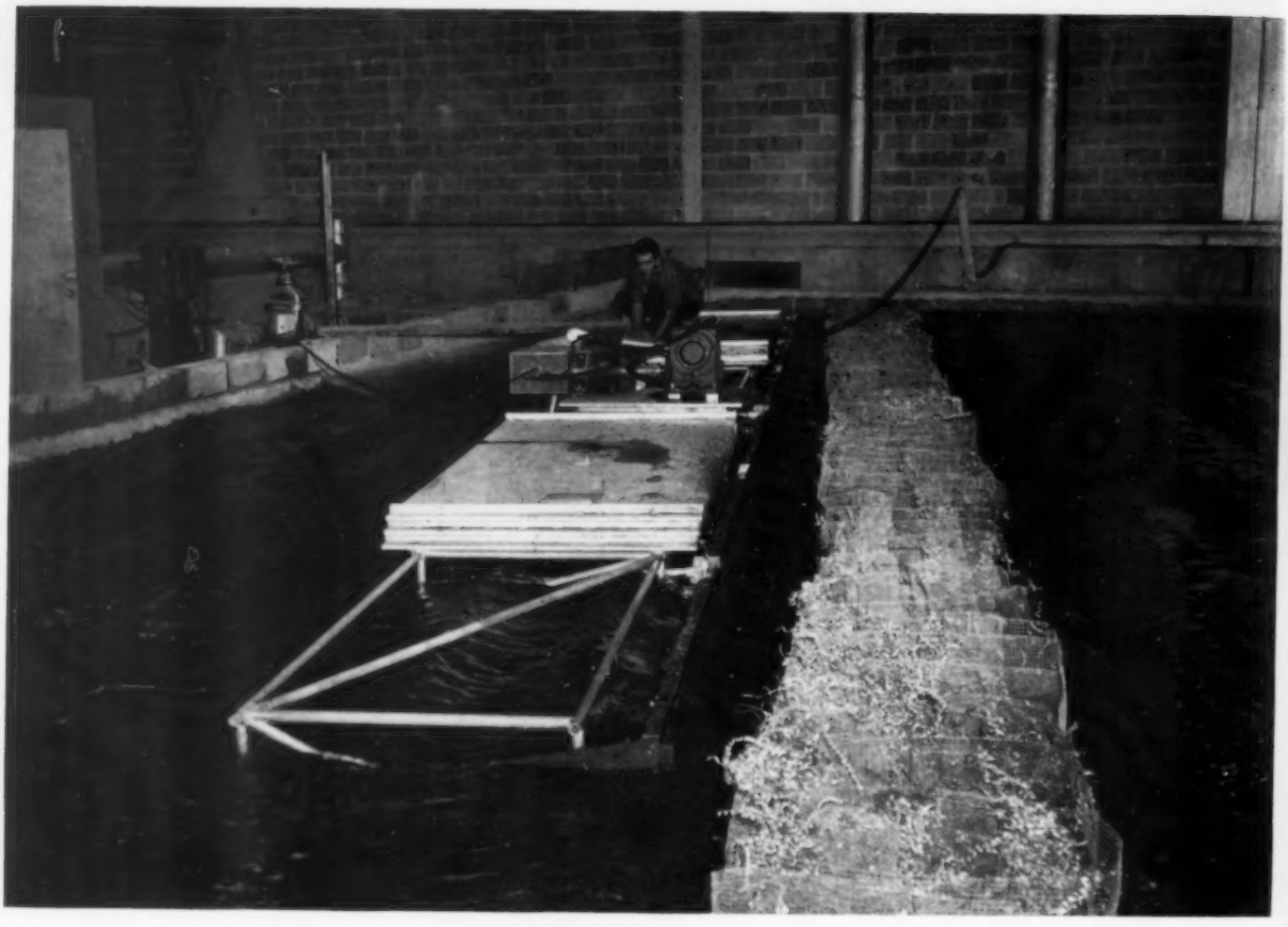
Consulting engineers brought the Port Cartier problem to the National Research Council. A model was built to the scale of 1:120. Though small enough to jump across, this model came up with the answers to a deep-water docking basin which will measure nearly half a mile in length. Waves of "storm" dimensions were directed against the model basin and experiments were carried out to suppress them. The answer came in three parts. It called for a particular design for the opening wing; for two of the inside beaches to be sloped in such a way as to absorb deflected waves; and finally for a beach at the harbour approach to refract waves from certain quarters before they can enter. To solve such a problem by mathematics alone would be an intricate and uncertain business. Even in straightforward projects the scale model can be worth while as a double check; it gives wide scope for experimentation, or it suggests fine points of improvement.

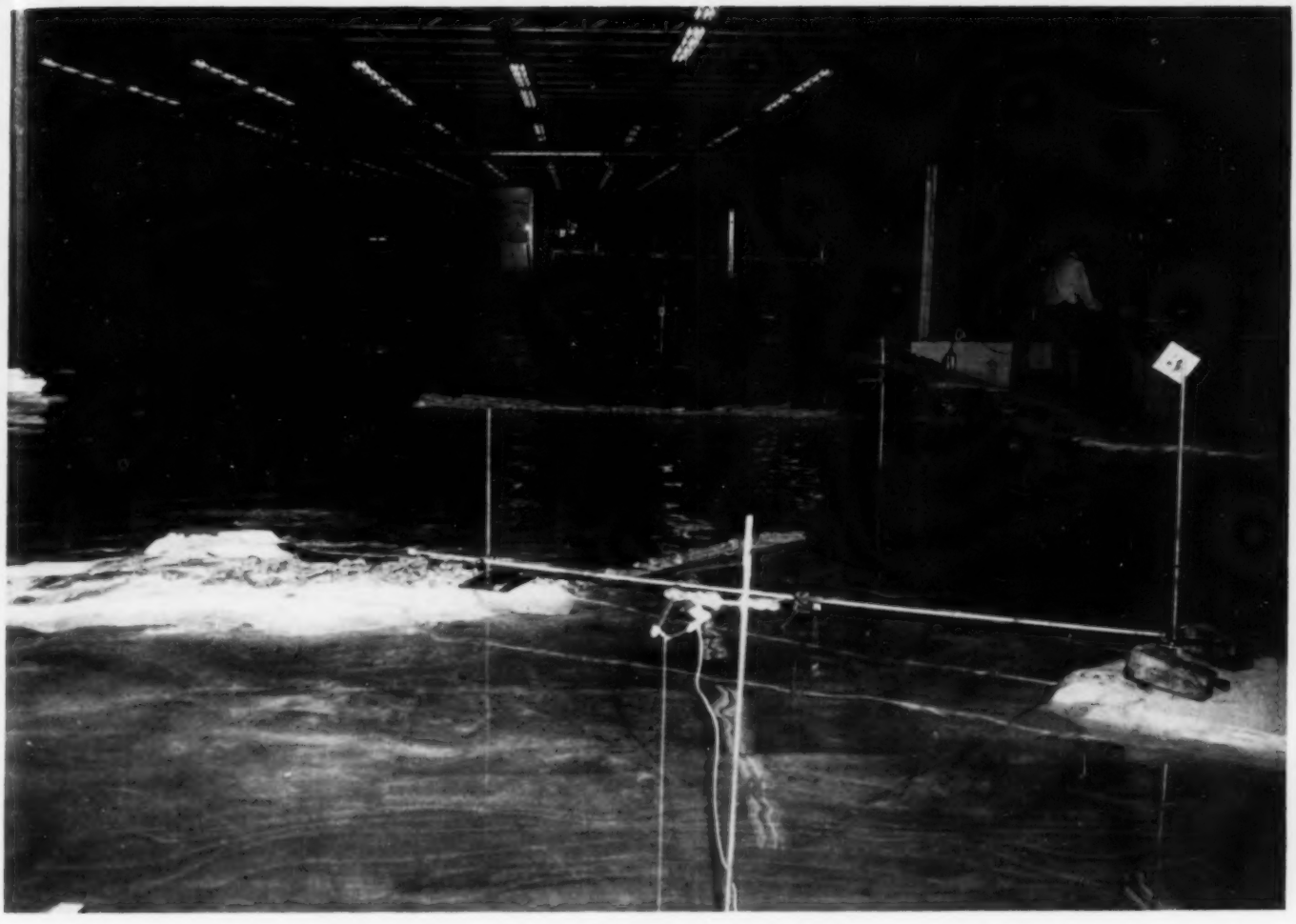
At present in Canada public works engineers are the most ready customers for the scale model. With the many problems arising out of their work on harbours and channels, dams and power houses, canal locks and sluices, they willingly place their trust in the miniature streams and waves of hydraulic laboratories. They know, of course, that there is more to scale models than meets the eye. There is a long history of their development in many countries extending over the past seventy-five years.

Scale models date from at least 1885, when Professor Osborne Reynolds of Manchester University built a small model of the Mersey River at Liverpool and began to conduct his experiments scientifically. Reynolds was the first to produce all-important theories of the time-scale between a model and its natural "prototype".

Shortly afterwards, another Englishman, L. F. Vernon-Harcourt, set up a scale model of the Seine Estuary. As many as fourteen improvement schemes had been advanced for the Seine, and the confusion among the experts was most discouraging. Vernon-Harcourt was a distinguished consulting engineer, and his faith in the new experimental work as opposed to the abstract theories of his day gave the hydraulic scale model its first professional status.

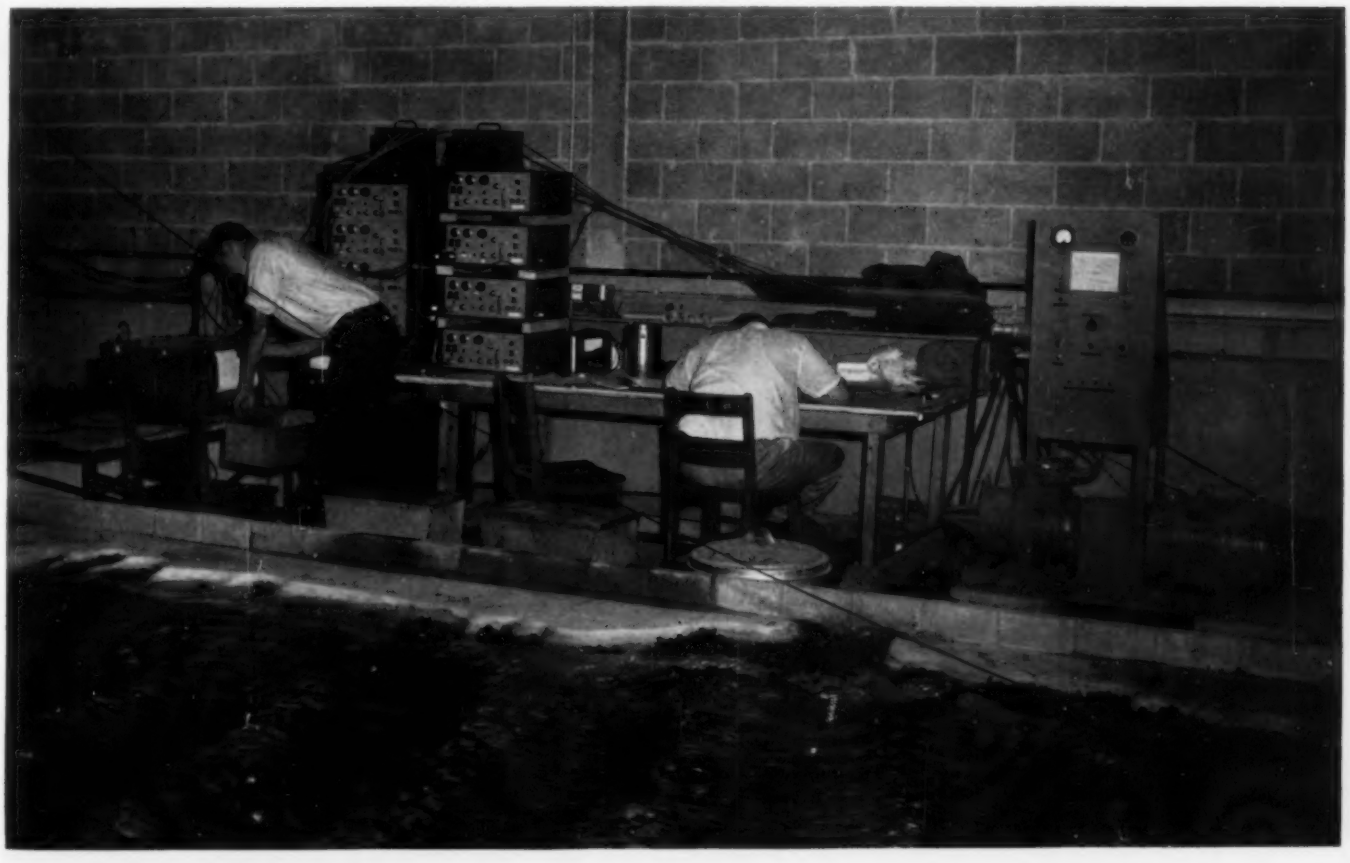
In the present century elaborate and permanent models have been built for a number of rivers and harbours in Britain, India and Ceylon, and today large hydraulic centres are operating at Wallingford, Teddington, Aberdeen, Glasgow.





**Some Details of the Port aux Basques Harbour Model**

*Top left:—Motor driven wave-generator. The wire mesh is a damping device.*
*Bottom left:—Wave action on experimental breakwater.*
*Above:—Instrumentation for recording water movements.*
*Below:—Electronic recording aids*



In France and Germany outstanding work with scale models is done at Grenoble, Chatou, Alfort, Toulouse, Dresden, Hanover, Karlsruhe; in the Netherlands at Delft, in Switzerland at Zürich, in Sweden at Verkstaden. As early as 1933 the USSR had many "hydrotechnical" laboratories involved in a vast amount of work both pure and applied. Even in China, since 1937 hydraulic models have been used to investigate problems of navigation, flooding and irrigation on the great inland waterways, the Yang-tze and Hwang-Ho Rivers. Several hydraulic centres have been developed in the United States, the oldest and best known being the Waterways Experiment Station at Vicksburg, Mississippi. Around the world the list of hydraulic projects which scale models have helped to build reads like a catalogue of modern wonders: dams, power houses, breakwaters and port facilities on every continent.

In Canada the NRC began work with hydraulic models in 1945. The first investigations were for spillways, chutes, log booms, power plants, water tunnels and open channels. The first harbour model was of Kingsville Harbour on Lake Erie. A more ambitious project, begun in 1950 in co-operation with the federal Department of Public Works and the University of British Columbia, was an outdoor model of the Fraser River delta. The model, representing fifty-seven miles of the river below New Westminster, was built on the grounds of the university, at Vancouver. It was framed in concrete, but supplied with sand and silt from the river itself. It was also equipped with automatic mechanisms for controlling tides and river flow in order to match the actual conditions in the river. This model is still in use, and the findings are being applied to improvement projects in the river.

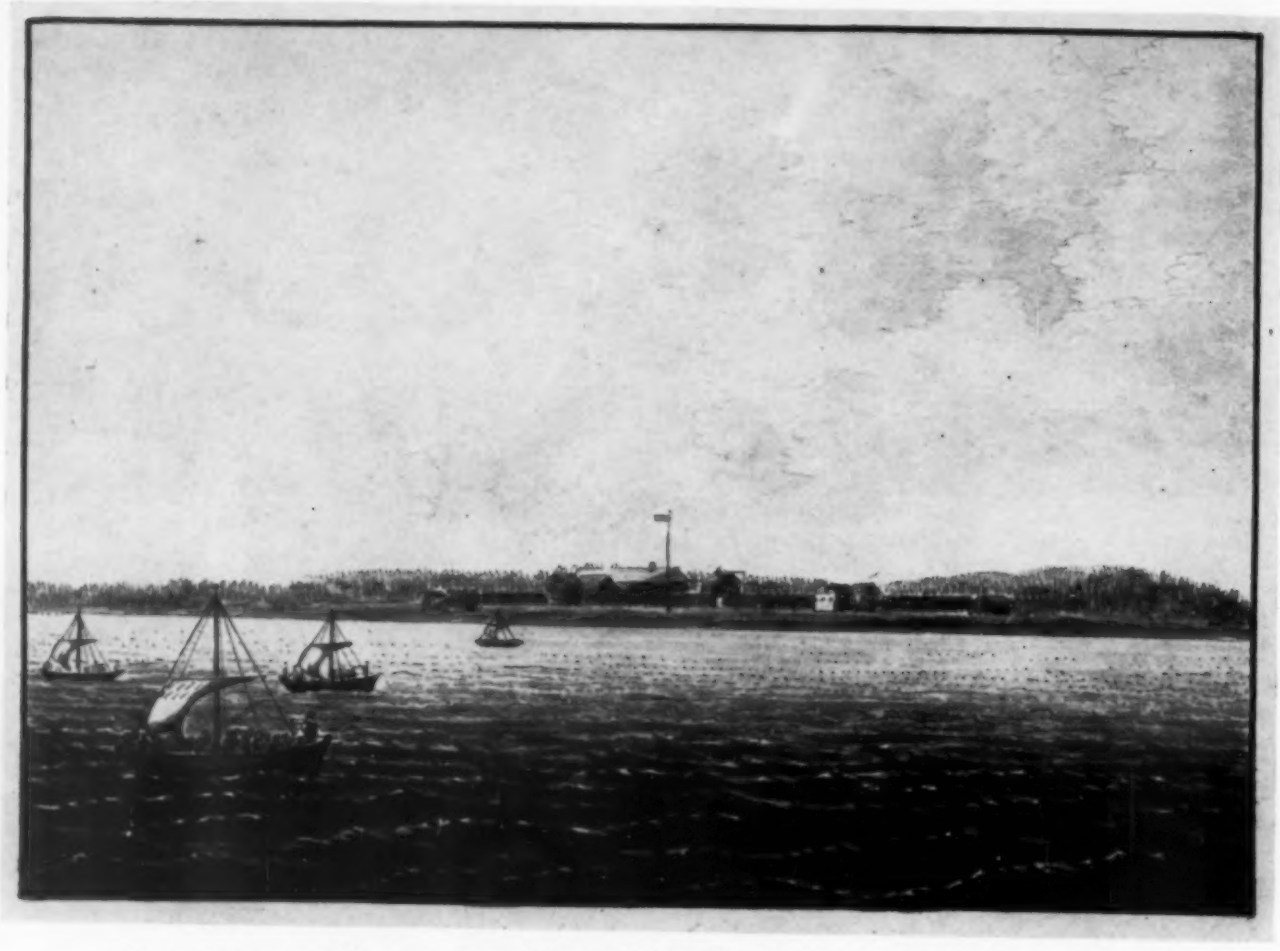
The decision to construct the St. Lawrence Seaway caused a boom in scale model research at the NRC. The new projects taken on for the Seaway were only part of a very large Canada-

*Top left and bottom left:—Early stages of a river model. Engineers at the NRC, Ottawa, laying the foundation for the Galop Rapids model, representing a section of the St. Lawrence River.*

*St. Lawrence River models. Right front: at Cornwall Island. Left centre: at Galop Island.*

United States programme of model studies which included work by the Ontario Hydro at Islington, and by the U.S. Army Corps of Engineers at the Waterways Experiment Station at Vicksburg, Mississippi, and the St. Anthony Falls Hydraulic Laboratory, Minneapolis, Minnesota. At Ottawa the NRC used a model to investigate the proposed changes of the St. Lawrence at Cornwall Island. The changes were mainly in the form of excavations, dredging, and the raising or lowering of water levels, but these interacted on one another to produce complicated effects. By splitting up the problems of the St. Lawrence between them and exchanging the results of their researches, Canadian and American engineers handled a job which has been referred to as unsurpassed in the history of engineering.

On the Seaway project Canada had her own problems with canal locks and guard gates which differed from those across the river, owing partly to differences in foundation soils. One of these problems was to reduce water turbulence during the filling and emptying of locks. The largest lock chambers, with lifts up to fifty feet, had to absorb three million cubic feet of water in less than eight minutes, with maximum flow of 10,000 cubic feet a second. Special design was needed to avoid the surge wave which comes from a sudden pile-up of water at one end of the lock, as well as other oscillations and eddies which can exert disturbing forces on a ship. A lock which was to be located at Cote Ste Catherine, near Montreal, was chosen for a scale model study at the NRC. The design which came out of this investigation differed in several ways from the conventional canal lock, but its success in operation demonstrated once again the oracular power of the hydraulic scale model.



*Norway House in 1821 where Peter Fidler made his will and where he was told he was going to be retired after over thirty years' service with the Hudson's Bay Company.*
Public Archives of Canada photo

# The Odd Will of Peter Fidler

*by* VERA FIDLER

THERE ARE few things that pique the interest more than an out-of-the-ordinary will. And when a will ties up the residue of an estate for nearly one hundred and fifty years, but the residue has never been found, it is especially intriguing. Such was the will of Peter Fidler, early fur-trader and map-maker for the Hudson's Bay Company.

Dated at Norway House on his fifty-first birthday, August 16, 1821, Peter Fidler's will is one of the curiosities in the history of probate in Canada. In it he left his journals and maps to the Hudson's Bay Company and his library of five hundred books and his surveying instruments to the Governor of the Red River Colony. After making some provision for his Indian wife and their ten children, he made the following strange disposal of the residue of his estate:

"All my money in the funds and other personal property after the youngest child has attained twenty-one years, to be placed in the public funds, and the interest annually due to be added to the capital and continue so until August 16th, 1969 (I being born on that day two hundred years before), when the whole amount of the principal and interest so accumulated I will and desire to be then placed at the disposal of the next male child heir in direct descent from my son Peter Fidler."

The records of the Hudson's Bay Company

show that when Peter Fidler died at Norway House on December 17, 1822, he left, in addition to a small property in Bolsover, England, £1,575 invested in 3 per cent consols and a balance of slightly more than £500 in his account with the Hudson's Bay Company. He left the administration of his estate in the hands of three executors, the Governor-in-Chief of the Hudson's Bay Company, the Governor of the Red River Colony and the Secretary of the Hudson's Bay Company. But these men renounced probate of the will and in 1827 administration of the estate was granted to Thomas Fidler, the eldest son, then thirty-two years old. The following year the moneys Peter Fidler had left in the hands of the Hudson's Bay Company were divided equally among the ten children and it would seem that the courts must have set aside the provision whereby the residue of the estate was to accumulate until 1969.

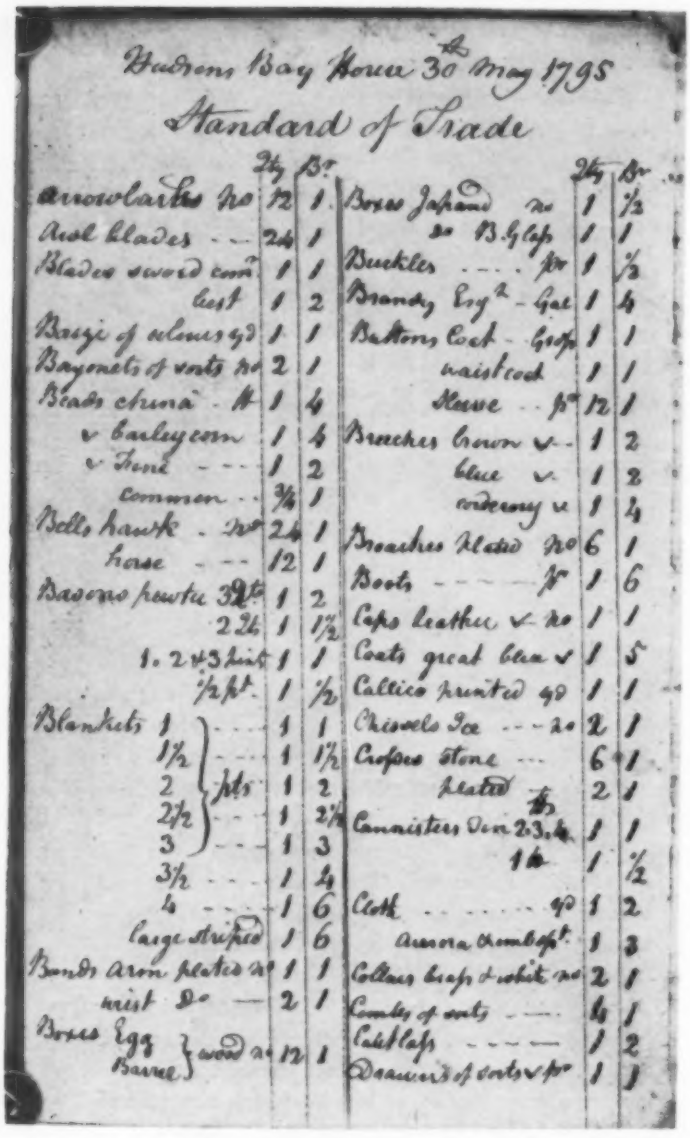
But what happened to the residue, if any? The will is preserved in the Prerogative Court of Canterbury at Somerset House in London and from time to time lawyers have been appointed to seek out the residue. Searches have been made of Hudson's Bay Company and Bank of England accounts, but no trace of any further money or property has ever been found.

"Queer old Peter Fidler", one historian has called this man who at the age of eighteen entered the service of the Hudson's Bay Company as a "labourer", then only two years later was chosen as assistant to Philip Turnor, the company's chief surveyor. The other assistant was David Thompson, who was later to become famous as map-maker for the North West Company. After Turnor returned to England and Thompson went over to the rival North West Company, Peter Fidler, then only twenty-six years of age, became the sole surveyor for the Hudson's Bay Company. He remained in that position until shortly before his death in 1822 and some historians claim that his contribution to the making of the map of Western Canada was even greater than that of David Thompson. Certainly, Peter Fidler was the surveyor of the Red River Settlement and he carried out numerous surveys on the Saskatchewan and Assiniboine Rivers and northwards to Lake Athabasca. And it is significant that when the Hudson's Bay and North West Companies amalgamated in 1821, Peter Fidler's maps were considered worthy of being sent to London, while Thompson's great map remained in Canada.

Some explanation of Peter Fidler's abilities, and perhaps of his strange will, may be found in his notebooks where he jotted down details of everything from a solar eclipse to the price of nails. One notebook, which over a century after his death turned up in a dusty bundle of papers in the Public Archives of Manitoba, is particularly enlightening. It covers much of his life in the North-West and plainly he was a man of better education than most of the "labourers" in the company's employ and he seems to have kept on educating himself all his life. Apparently of a mathematical mind, he enters in the notebook titles of books he intends to order from England, such as, "The Theory & Practice of finding the Longitude at sea or land, by Andw. Mackay" and "Sir Jonas Moor's Mathematicks". There are two pages of algebra and one is intrigued by the thought of a young man studying algebra on the prairies in the eighteenth century. He seems to have had an insatiable thirst for knowledge. Not only does he note the latitude and longitude of every post he visited, but he calculates the distance between different places — Montreal and Grand Portage, York Factory and Cumberland House and between these and other posts. When he learns that the Queen Charlotte Islands have been discovered in 1788, he tries to calculate how far they would be from Cumberland House, in what is now Saskatchewan.

But his mind ranged far beyond things geographical. He attempts to compute the total population of the earth and to divide that total according to religion. He draws up a table showing the average life span of wild animals and some of his estimates are rather surprising — "25 years" for the partridge, "100 years" for the raven, the eagle and the wild goose. He even lists the contents of a gun-chest of Eskimo and Indian "curiosities" which he sent to England in 1813.

There are plenty of entries to show the practical side of Peter Fidler's character. One page



Hudsons Bay House 30th May 1795

Standard of Trade

| | | Skins | Beaver |
|---|---|---|---|
| arrowlancets | no | 12 | 1 |
| Axe blades | | 24 | 1 |
| Blades sword common | | 1 | 1 |
| best | | 1 | 2 |
| Buzzi of allum | qd | 1 | 1 |
| Bayonets & rests | no | 2 | 1 |
| Beads china | lb | 1 | 4 |
| " barley corn | | 1 | 4 |
| " Tene | | 1 | 2 |
| common | | 3/4 | 1 |
| Bells hawk | no | 24 | 1 |
| horse | | 12 | 1 |
| Basons pewter | 32 in | 1 | 2 |
| | 22 | 1 | 1½ |
| | 1. 2 & 3 pint | 1 | 1 |
| | ½ pt. | 1 | ½ |
| Blankets 1 | | 1 | 1 |
| 1½ | | 1 | 1½ |
| 2 | pts | 1 | 2 |
| 2½ | | 1 | 2½ |
| 3 | | 1 | 3 |
| 3½ | | 1 | 4 |
| 4 | | 1 | 6 |
| Large Striped | | 1 | 6 |
| Bonds iron plates | no | 1 | 1 |
| mist Do | — | 2 | 1 |
| Boxes Egg | wood no | 12 | 1 |
| Barne | | | |

| | | Skins | Beaver |
|---|---|---|---|
| Boxes Japand | no | 1 | ½ |
| do B.L. Clasp | | 1 | 1 |
| Buckles | pr | 1 | ½ |
| Brandy Leg | Gal | 1 | 4 |
| Buttons Coat | Gross | 1 | 1 |
| waistcoat | | 1 | 1 |
| Sleeve | pr | 12 | 1 |
| Breaches brown | ✓ | 1 | 2 |
| blue | ✓ | 1 | 2 |
| corderoy | ✓ | 1 | 4 |
| Breaches Plaid | no | 6 | 1 |
| Boots | pr | 1 | 6 |
| Caps leather | ✓ no | 1 | 1 |
| Coats great blue | ✓ | 1 | 5 |
| Callico printed | qd | 1 | 1 |
| Chissels Ice | no | 2 | 1 |
| Crapes stone | | 6 | 1 |
| plated | lbs | 2 | 1 |
| Canisters Doz | 2.3.4 | 1 | 1 |
| | 1lb | 1 | ½ |
| Cloth | qd | 1 | 2 |
| Aurora Dromb | pt | 1 | 3 |
| Collars Clasp & robit | no | 2 | 1 |
| Combs of ivory | | ½ | 1 |
| Calf Clasp | | 1 | 2 |
| Drawers of cotton | ✓ pr | 1 | 1 |

*A page from the notebook showing the prices of trading goods in beaver. From the notebook found in the Provincial Library of Manitoba.*

Public Archives of Manitoba photo

shows patterns, with detailed measurements, for a man's coat and a child's coat and we wonder if his Indian wife was able to read the instructions or if Peter Fidler used the patterns himself. On a quarter of a page he tells how to build a windmill and on another page he itemizes the cost of building a stone house. He does not mention where the house was built, but such items as "Poor Assessments" and "Slate" suggest that it may have been in England. He notes the dimensions of a variety of things — the *bateaux* of the Hudson's Bay Company, the beaver-press, copper camp kettles. Listed in full is the "Standard of Trade" (price of trading goods in terms of beaver skins) used by the company in 1795 and we have a list of prices the company charged its servants for goods in 1801 and in 1806. For instance, in 1801 a gallon of rum cost twelve shillings but the price had dropped to eight shillings in 1806. In 1801 Peter Fidler could buy for himself a pair of "Fearnaught" trousers for one beaver skin and he could buy a guernsey dress for his wife for six shillings. But in 1806 the price of these dresses had risen to nine shillings.

After the custom of the country, Peter Fidler early in life entered into an "Indian Marriage". There were no clergy in the West at that time, so the ceremony in these unions between white men and Indian girls merely consisted of gifts to the girl's father. If she was particularly attractive, the gift might be a gun or a horse, but what seems to have been most appreciated was a gallon of rum. Peter Fidler does not record what he gave for his wife but, unlike many of the white men who freely deserted their Indian wives and children, he lived with her until he died. Indeed, two years before his death he married her in a legal ceremony performed by the Reverend John West, newly appointed chaplain to the Hudson's Bay Company, who at the same time baptized the Fidler children.

Peter Fidler's wife bore him fourteen children and we find his notebook serving one of the purposes of a family Bible. On the lower half of one of the pages he lists the dates and places and even the hour of birth of each child. They were a much travelled family for while two children were born at Nottingham House and two at Cumberland House, all the others were born at scattered posts of the Hudson's Bay Company. Only four died before he did, which seems a remarkable record for those times; the date and time of day each one died is faithfully set down and after an entry noting the

death of a ten-year-old child, he records, "Ill 24 days".

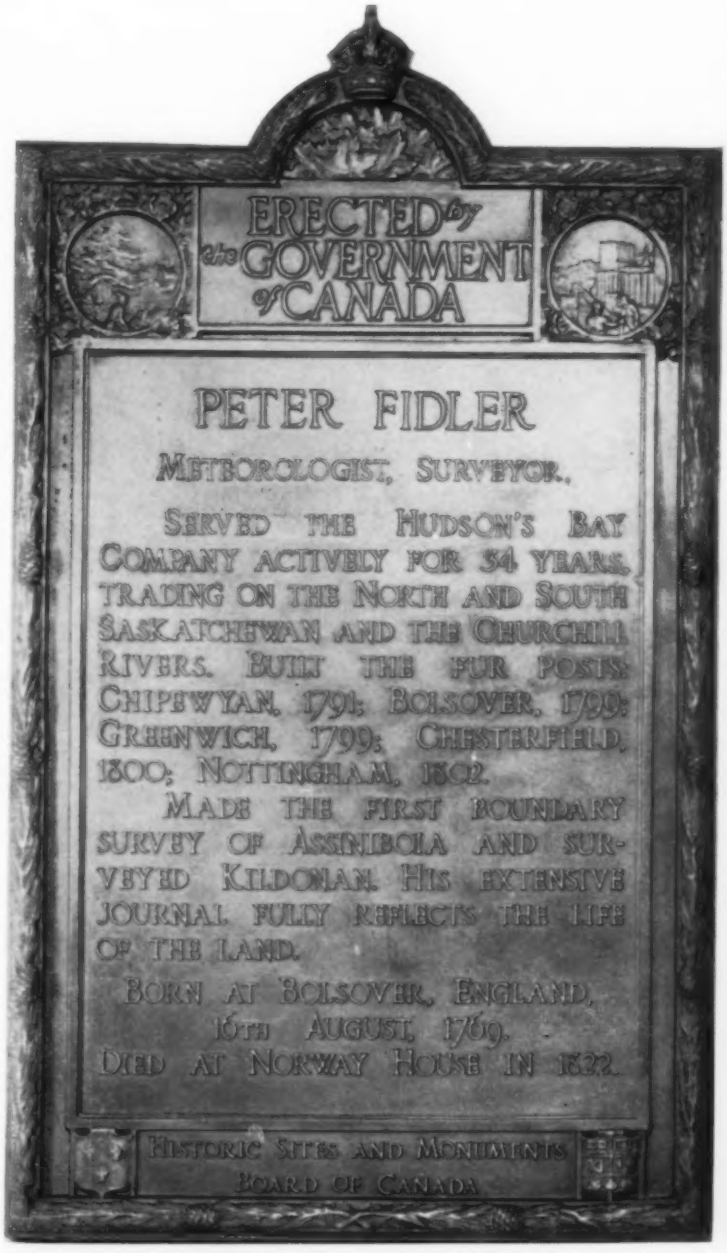
One theory that has been advanced as a reason for Peter Fidler's making such an odd will is that, with ten children living at the time, he may have considered that if at his death his total estate were divided among his wife and children, none would receive a sum that would amount to much. But, being educated along mathematical lines, he may have had in mind how even a small amount of capital would increase at compound interest over a long period of time, so devised a will that might provide at least one of his descendants with something worth while.

Another, and perhaps more logical, speculation is that he planned the will as a means of keeping his name from being forgotten. Five days before he drew it up, he had been told that he was going to be retired. Nicholas Garry, Deputy Governor of the Hudson's Bay Company, was then at Norway House on a trip arranging for amalgamation with the North West Company and on August 11, 1821, he wrote in his journal: "Mr. Fidler's maps at York Factory should be sent to England. Assured him that he should remain in the service. That he shall have a retired share. To remain the winter at Norway House with Mr. Robertson".

Told that he was going to be retired after more than thirty years of distinguished service with the company, Peter Fidler may have hit upon the idea of a unique will as a means of providing for himself a posthumous fame to keep his name from falling into oblivion. The fact that he did not name his eldest son but his namesake, Peter, in the will would seem to be a point in fa·our of this argument.

Whatever his reason, Peter Fidler was for a long time one of the forgotten men in the history of Western Canada. Perhaps because the year 1969 is not too far off, twice in recent years he has emerged from obscurity for a brief time. In 1955 the Government of Canada erected a monument to him at Meadow Lake, Saskatchewan, choosing this place because he was the first white man to follow the Meadow River to its source at Meadow Lake. About the same time his large map of Western Canada, painstakingly drawn, was acquired by the Public Archives in Ottawa where it may be seen by anyone interested in the early fur-trading days.

But the question still remains. Was there any residue in Peter Fidler's estate and if there was, where is it ?

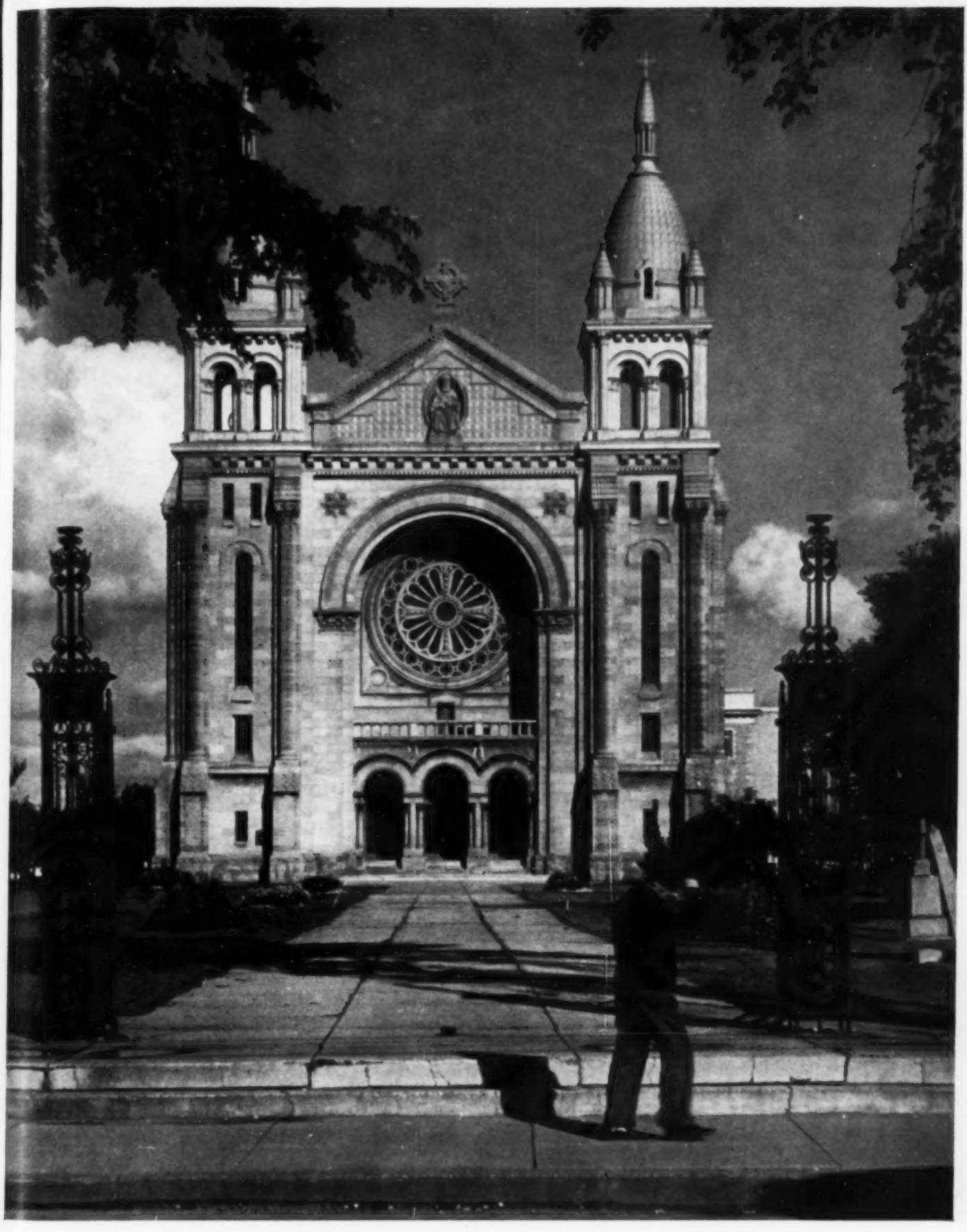

ERECTED by the GOVERNMENT of CANADA
PETER FIDLER
METEOROLOGIST, SURVEYOR,
SERVED THE HUDSON'S BAY COMPANY ACTIVELY FOR 34 YEARS, TRADING ON THE NORTH AND SOUTH SASKATCHEWAN AND THE CHURCHILL RIVERS. BUILT THE FUR POSTS: CHIPEWYAN, 1791; BOLSOVER, 1799; GREENWICH, 1799; CHESTERFIELD, 1800; NOTTINGHAM, 1802.
MADE THE FIRST BOUNDARY SURVEY OF ASSINIBOIA AND SURVEYED KILDONAN. HIS EXTENSIVE JOURNAL FULLY REFLECTS THE LIFE OF THE LAND.
BORN AT BOLSOVER, ENGLAND, 16TH AUGUST, 1769.
DIED AT NORWAY HOUSE IN 1822.
HISTORIC SITES AND MONUMENTS BOARD OF CANADA

*Bronze tablet on a monument erected in 1955 at Meadow Lake, Saskatchewan, to commemorate the public services of Peter Fidler.*
Government of Canada photo

## *Pictures of the Provinces—XXI*

*The bulbous towers and spires, surmounted by crosses, rise on the Ukrainian Catholic Church at Portage la Prairie, Manitoba. A couple of parishioners pause to chat along the sidewalk, where small white houses nestle among trees, flowers, hedges, and small kitchen gardens.*

Richard Harrington



*The basilica at St. Boniface, Man., with its "turrets twain", which achieved international reputation in John Greenleaf Whittier's poem "The Red River Voyageur". St. Boniface contains the largest concentration of French Canadians in the West, and is a busy industrial community. The basilica is both an historical and a religious shrine. Louis Riel is buried in the grounds.*

Richard Harrington

# The Cities of Ancient Mexico

*by* CHARLES GALLENKAMP

IT WAS NOT UNTIL the middle of the nineteenth century that the archaeological world awoke to the fact that traces of ancient civilizations were to be found in the New World as well as in the classic regions of Europe and Asia. The idea that the native peoples of America had at any period risen above savagery was a new concept to those bred in the lore of the Parthenon or the Pyramids. It is only during the past century that the new light of research has revealed to us the heights to which the indigenous cultures of Mexico and Central America had ascended, and a vast new field for historical study and intelligent conjecture was opened up. It was the revelation of these new and unexplored archaeological sites that first attracted the author's attention, and led him to organize scientific investigations which might throw additional light on these strange monuments of an unknown past, and to seek an explanation for the mysterious causes which led to the rise and fall of those cultures which flourished so abundantly in the lands between northern and southern America for many centuries before the Columbian era.

Accordingly the author bent his steps towards Mexico in the hope of solving some of these problems. He noted that the ideals which motivated the growth of pre-Columbian civilizations are closely allied with their unique, vital forms of artistic expression, giving tangible proof of the religious absorption in which their evolution was cloaked. His researches were carried out under the auspices of the *Instituto Interamericano* of Denton, Texas. During the winter of 1950-51 he toured the ancient ruins of

*At top:—A pyramid temple dedicated to the god Tlahuizcalpantecuhtli, one of the largest structures excavated at the Toltec city of Tula in Hidalgo, Mexico. The Toltecs flourished from the fourth to the twelfth centuries A.D., and evolved one of the highest pre-Columbian civilizations.*

central Mexico, and then made an expedition to film the surviving tribes on the west coast of Mexico. During the winter and spring of 1955-56 he conducted an extended expedition to collect photographic material illustrating archaeological sites from northern Mexico to Central America. The following article reveals some of the fruits of these labours.

* * *

In the spring of 1519 the Spanish explorer Hernando Cortéz landed with a small army of adventurous followers on the barren coast of Veracruz in Mexico. They had come to seek out and conquer the fabled cities whose temples and palaces had yielded the golden treasures brought to Cuba by survivors of earlier voyages of discovery.

They stood at the threshold of an unknown land — a vast expanse of volcanic mountains and disease-ridden jungles — prepared to wager the effectiveness of steel swords and armour, horses and firearms, against the powerful armies of the Aztec empire which had brought nearly all of central Mexico under its domination. The lure of gold had impelled the age of exploration and conquest that was to signal the downfall of the most brilliant civilizations of pre-Columbian America. By November, the Spanish army had reached the Valley of Mexico and the Aztec capital city of Tenochtitlán.

What they saw as they stood gazing at the city for the first time filled them with wonder. This was not the dwelling-place of savages as they had expected. Here was a centre to rival the beauty of Venice or Naples — a maze of carved stone palaces, temples and public squares, containing 300,000 inhabitants and stretching to a circumference of twelve miles. The city was laid out upon a broad-terraced island at the western edge of Lake Texcoco, connected with the mainland by a series of causeways wide enough, the Spanish chroniclers reported, for "twelve soldiers to walk abreast". Flowing out from the city to the lake was a network of canals which permitted small boats to move freely about its market places and plazas. Of the almost 60,000 houses in Tenochtitlán, most were of gleaming white stucco or cut stone, and towering above them were the mas-

*Detail of a wall representing human skulls emerging from the mouths of serpents, at Tula.*

*Monoliths in the form of Toltec warriors provide evidence of mastery in stone sculpture. These figures which stood fifteen feet in height, originally formed a colonnade supporting the roof of a temple at Tula.*

sive *teocalli* or pyramid temples, the centres of Aztec religious life.

The largest of these gigantic terraced pyramids was dedicated to Huitzilopochtli, the god of war. Narrow steps led to its flat-topped summit, where there were two shrines enclosing stone images of the god encrusted with gold, turquoise, jade and pearls. Inside these shrines, as practically everywhere throughout the city, perpetual fires were kept burning, tended only by young girls of holy order.

Clustered near the great temple of Huitzilopochtli were more than forty lesser *teocalli*, richly ornamented with carved stone. From atop these temples, which were consecrated to various other deities, stone effigies of entwined serpents, heads of snarling jaguars and fierce gargoyle-like visages looked out over the city's streets and courtyards to the mist-enshrouded mountains beyond. And in the broad central plaza stood the *tzompantli* with its skulls of sacrificial victims neatly displayed on spits. Here the Spanish chroniclers counted more than 136,000 human skulls, but this grim evidence of the Aztec obsession with feeding their gods the flesh of enemies did not quench the Spaniards' lust for gold.

In one of the most incredible military campaigns in history, Cortéz quickly brought all of Mexico under the domination of Spain. Tenochtitlán — the last great flowering of pre-Columbian civilization — was reduced to ruins. What had not been destroyed in the battles of the conquest was deliberately wrecked by the missionaries who accompanied Cortéz in their efforts to eradicate the influence of heathen traditions. The remaining temples were pulled down; idols were smashed and sacrificial altars buried. To the fires went priceless specimens of Aztec art and written *codices* — manuscripts of native origin without which the story of ancient Mexico will remain forever incomplete.

But the Indian heritage was never entirely erased from the land. It has continued to live on, irrevocably contained in the spirit and culture of present-day Mexico. Its influence has become an integral part of the metropolis that sprang from the ruins of Tenochtitlán — the place we call today Mexico City.

Aztec civilization had grown out of the remnants of glories far more ancient. Scattered throughout Mexico are crumbled monuments and cities that reflect achievements even more eloquent than Tenochtitlán. At Monte Albán,

*A stone figure representing a Chacmool excavated at Tula. The Chacmools were fire gods or deities of fertility; they are found in archaeological sites all over Mexico and Central America.*

in Oaxaca, one finds an entire mountain levelled off to form a base for a vast complex of temples, palaces and courtyards erected by Zapotec tribesmen who lived at the dawn of the Christian era. In the dense jungles of Veracruz, near La Venta, archaeologists uncovered sculptured stone heads weighing as much as thirty tons. At Tajin, there rises starkly out of the forest a pyramid temple of such exquisite design and execution as to rival the finest examples of Oriental and Classical architecture. And the cultures of the Tlaxcalans, the Totonacs and Olmecs had already lived out their golden ages centuries before Aztec armies overran them.

Within a few miles of Tenochtitlán were magnificent fallen cities built by mysterious tribesmen known as the Toltecs, who had learned to carve stone, make calendrical calculations and erect flat-topped pyramids long before the Aztecs appeared on the horizon of Mexican prehistory. But the Toltecs have stubbornly resisted the inroads of archaeological exploration. They remain a paradox — a people whose influence spread throughout the Valley of Mexico, but whose history is for the present largely obscured by a mist of fable and fragmentary evidence. Their story had lapsed into obscurity centuries before Cortéz set foot in the New World. Of the Aztecs, however, we know much more. European eyes recorded the scope of their achievements. The period of their florescence joined hands with the western world — at least long enough for us to glimpse something of their splendour in passing.

It is generally agreed by most archaeologists that Aztec history began with the founding of Tenochtitlán in A.D. 1325. Just how long the germs of civilization had dwelt in the Valley of Mexico prior to that time is not known; but men possessed of simpler desires and the instinct to hunt had undoubtedly roamed through Mexico for thousands of years. One thing, however, is certain: no degree of civilization could have been attained without agriculture, and it is probable that Mexico's fertile valleys and mountain sides were being cultivated as long ago as five thousand years. Yet it was still a long stride from learning to grow one's own food to building stone cities and exploring the solar system for a means of computing time. A great deal took place in Mexico during those archaeologically obscure centuries, long before the Aztec's dream of empire came to fruition.

*The Pyramid of the Sun at Teotihuacan, an exceptional example of pre-Columbian architecture, extending 700 feet along each side of the base and rising to a height of 200 feet. It dominated the religious centre of the Teotihuacanos, which consisted of many smaller temples and pyramids constructed along an avenue known as the Way of the Dead.*

It is not definitely known where the Aztecs came from originally. Probably they were one of a number of semi-nomadic tribes who spoke a dialect called Nahuatl and inhabited northern Mexico during the period the Zapotec, Toltec and other cultures were maturing in the south. These Nahuatl-speaking tribes descended into the Valley of Mexico at the close of the Toltec period, in the eleventh or twelfth century, and there is every reason to believe that the Aztecs were among them.

They could not have chosen a more ideal location from which to launch an empire. The valley is a huge, basin-like depression scooped out of a mountainous plateau by volcanic disturbance. It is blessed with luxuriant sun, abundant rainfall and several mountain-fed lakes of which Texcoco was the largest. Its location, and the fact that the embers of earlier achievements still smouldered nearby, made the valley an ideal cradle for a fresh civilization.

As imperialists, the Aztecs had no equals in the New World. Even the superb Inca union in the Andean highlands did not include the vast geographical area or complex administrative problems as did that of the Aztec empire. A hundred years after gaining a foothold in the valley the Aztecs had emerged as the dominant political and cultural force in ancient Mexico. They further secured their position by forming an alliance with the powerful neighbouring cities of Texcoco on the eastern edge of the valley, and Tlacopan to the west. Shortly after the formation of this confederacy, the sagacious leadership of Montezuma the First won control of it for the Aztecs, and launched the three member nations on a series of highly successful wars aimed at spreading the union's power far beyond the valley itself.

Equally profitable was their administration of conquered provinces. The subjugated colonies were reorganized as city-states. Local governments continued to function more or less as they had before, but with the addition of imperial ministers whose duty was to protect the interest of the confederation.

Heavy taxes were exacted from the colonies and the emperor's treasury overflowed with the most exotic tributes imaginable: pottery and jewels from Cholula, gold and feather robes from Azcapotzalco, fish and fruits from the Totonacs, carved stone and jade sent by the Olmecs, and baskets of flowers from Xochimilco, which were delivered daily to embellish the royal palace and temples in Tenochtitlán.

When the state had requisitioned its share of

these colonial tributes, the remainder went to Tenochtitlán's huge public market place to be sold along with other products. Here, in dozens of flower-arrayed booths and porticos, one could buy or trade everything from slaves to perfumes. To market came varieties of meats, beans, squash, tomatoes, melons, avocados, pineapples and maize. One could purchase drugs made from roots and herbs, chocolate, cotton cloth, baskets, hides and leather goods, mirrors, wood carvings, clay and stone sculpture, jewelry, and building materials.

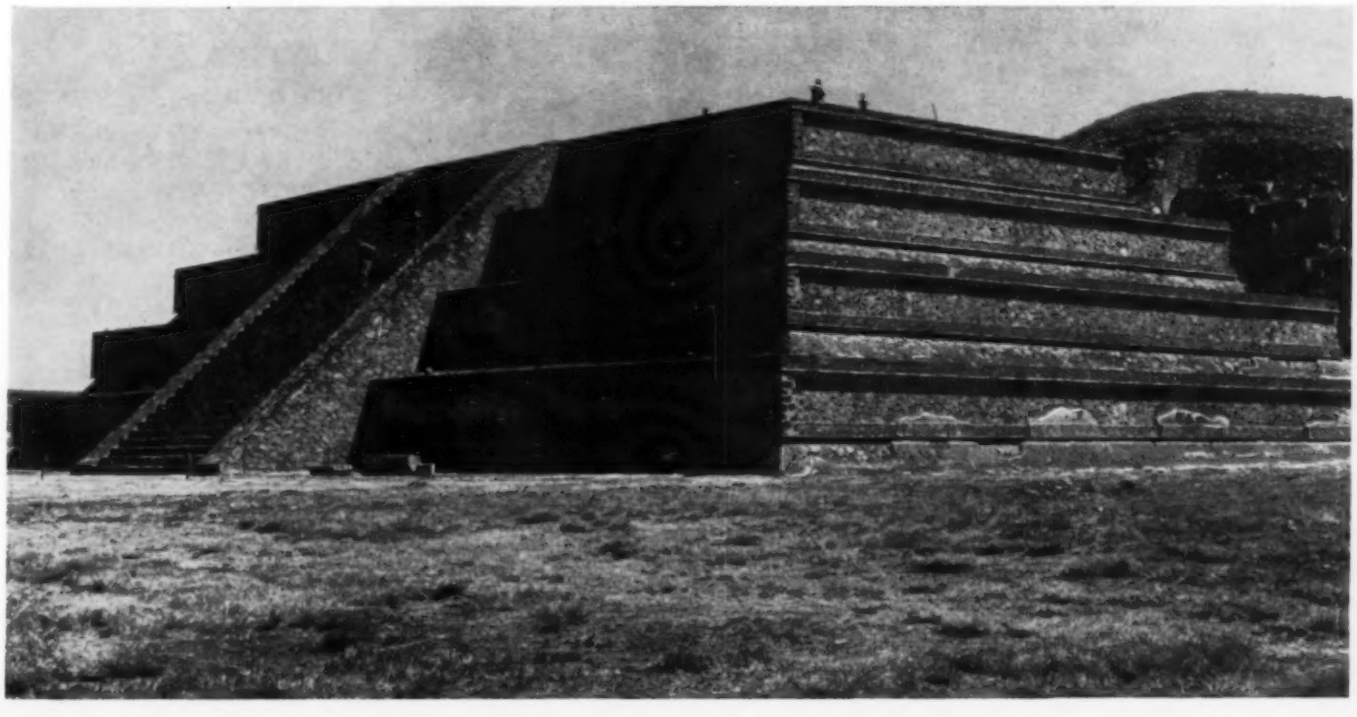
Despite the pompous display of wealth to be found in Tenochtitlán, there remained a vast difference between the condition of the poorer classes and the voluptuous existence of the aristocracy. The emperor and nobility ruled affairs of state with an absolute hand of authority. At the helm of the empire's religious destiny was the priesthood, whose advice the emperor frequently sought, especially in matters of war. There were said to be over 5,000 priests serving the temple of Huitzilopochtli alone, not to mention those of other temples and cults consecrated to the numerous gods of the complex Aztec pantheon.

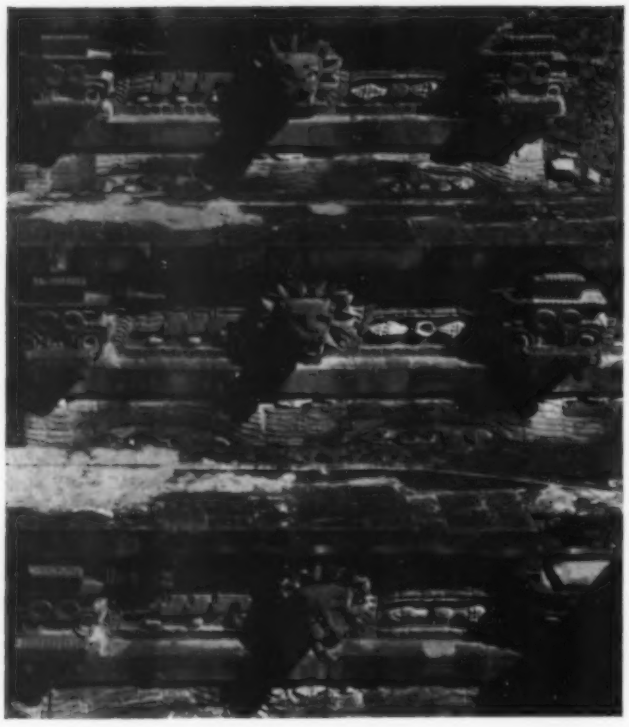
Yet the empire was not without certain democratic manifestations. No one was born into slavery, and those who for various reasons became slaves retained certain legal rights. Productive resources were communally held, though some land was set aside for payment of tribute or to supply persons or institutions of special privilege. In Tenochtitlán a well-established judicial council administered justice evenly and fairly, without favouritism or bias. There were schools called *telpuchcalli* which instructed children of all classes in the arts of living — citizenship, arts and crafts, war, mythology and history; and special schools known as *calmecacs* instructed outstanding students in priestcraft and hieroglyphics.

Religion, more than any other single factor, welded the union together. The Aztecs throve on the rich pageantry and ceremonial rituals which revolved around a strictly observed calendar of events dedicated to the gods, who were believed to dwell on the still smouldering volcanoes of Popocatépetl and Ixtaccíhuatl, overlooking the valley.

From the fiery mountains the gods could watch as long lines of richly-costumed Indians, accompanied by the throbbing of deep drums, assembled in the courtyards of the pyramid temples to feast and dance in their honour, or toast them with the blood of human sacrifices. There were gladiatorial spectacles enacted before enthralled crowds in the public arenas — captives, brought from battlefields in cages then shackled to huge stones, who defended themselves with dummy weapons against Aztec warriors in full battle array; or

*The temple of Quetzalcoatl at Teotihuacan gives compelling evidence of an advanced knowledge of mathematics and principles of architectural design. On the right can be seen the walls of an older pyramid.*





*A detail of the older terraced temple of Quetzalcoatl, showing the elaborate stone sculpture which formerly adorned its entire surface.*

the arrow sacrifice, its victims spread-eagled on frameworks and riddled with arrows from the bows of picked archers. Xipe, the god of flayed flesh, received special homage from the priests of his cult, who drew off the skins of living victims and dressed in them for a period of twenty days following the ceremony. Such macabre dramas were supreme offerings of appeasement to the gods, who alone could bring their subjects the cherished knowledge of unknown realms.

Consider for a moment the marvellous religious structures scattered throughout Mexico, hewed from rock with nothing but stone implements. Consider that beasts of burden were unknown and the principle of the wheel was never applied in the New World, yet tons of building stone were transported over miles of jungle and swamps virtually impassable today even with modern machinery; that Mexican craftsmen mastered to perfection the art of stone sculpture, of cutting and polishing topaz, sapphire and amethyst in infinite detail, and carved masterpieces in crystal and jade; that, while searching the heavens for an understanding of the spheres beyond their immediate realm, the astronomer-priests charted the movements of stars, computed solar time and evolved a calendrical system of astounding accuracy. Consider, too, the countless other achievements springing from the genius of pre-Columbian America, and we sense something of the religious fervour which explains, in part at least, how great civilizations come into being: men will move mountains to search for their gods! Thus it was with the Aztecs, and in similar measure with the primal tribes that preceded them in exploring the unfathomable cycle in which man and his civilizations live out their destinies.

In all things the Aztecs did could be heard the rumblings of these more ancient, more profoundly ingenious streams of life, reaching far back into the remote past. Recorded history tells us nothing about these earlier inhabitants of Mexico. We must rely entirely upon archaeological deduction inferred from their fragmentary remains.

Unquestionably the first permanent settlements were established by maize farmers whose cultural accruements allowed little more than a simple agrarian existence. Implements were fashioned of stone, antler, and bone; they wove baskets and sandals from vegetable fibre. Pottery was moulded in the form of utilitarian vessels and effigy figurines. The bow and arrow was unknown to them; instead they used the *atl-atl*, or throwing stick, which afforded greater leverage than flint-tipped spears hurled by hand.

Their dwellings consisted of stucco or packed earthen walls reinforced by a framework of poles and roofed with thatched reeds or grass. Over thousands of miles were scattered the irregular villages of these archaic farmers: latticed fields of crops on the edges of which squatted rows of houses and nearby ceremonial structures — earthen pyramids and platforms raised to support shrines to the infinite gods on whose benevolence depended good or bad fortune.

Very early in their history the permutations of the heavens, the key to seasonal changes, were recognized as bearing upon the growth of crops. It was further believed that the shifting stars withheld prophecies by which the predestination of man could be determined. Accordingly astronomer-priests and shamans — the guardians of their increasingly theocratic societies — sought to interpret these mystical realms and foretell the inclinations of deities

believed to govern them that they might be abundantly appeased. They began to observe the night skies along fixed lines of sight, and noted the environal phenomena presaged by astral movements. Eventually the duration of solar and lunar cycles were measured and utilized as the basis of an extremely accurate calendar. Simultaneously came ingenious advances in architecture; the fragile structures of earlier centuries were superseded by thick-walled buildings of solid stone.

Out of this archaic background there emerged during the first millennium after Christ numerous tribes possessing this advanced knowledge of architecture and calendrics. In the dense rain forests of Middle America the Maya — often likened to the Athenians in the scope of their intellectual attainments — founded a vast empire. In the arid highlands of Oaxaca the Zapotecs were building their superb cities; the Olmecs and Totonacs erected astounding monuments in the forested recesses of Tabasco and Veracruz. And the central plateau was the scene of relentless activity as diversified peoples, among them the Chichimecs and Toltecs, rose to eminence and collapsed.

Time and again in these prehistoric happenings we are faced with unanswered questions. Where did the impetus towards higher attainments originate ? Exactly who were the people who left behind them the marvellous City of the Dead, Teotihuacán, a tribute of such beauty and magnitude that one viewing its ruins almost feels the gods for whom it was intended still hover there, sealing off from us the details of its history ?

At Teotihuacán, along an avenue called the Way of the Dead, dozens of square-crested pyramids, enclosed by walls and plazas, reach into the sky. Half-way along this main avenue stands what is perhaps the most impressive building in all of ancient America — the Pyramid of the Sun, its huge bulk only slightly smaller than the great pyramidal tomb of Cheops in Egypt. To the north, at the far end of the Way of the Dead, is the Pyramid of the Moon, its beautifully terraced form still largely obscured by the rubble of centuries. At the southern limits of the city a vast rectangle of masonry encloses a lavishly ornamented temple, dedicated to the god Quetzalcoatl. Along the terraces of this pyramid, sculptors chiselled in bold relief gigantic heads of the feathered serpent, that he might watch as his followers gathered around the temple to dance or sacrifice a captive in his honour.

Everywhere one looks at Teotihuacán there are miracles in stone, and we can only guess at the enormous expenditure of human energy required to construct the magnificent sacred city. The same may be said of the recently discovered Toltec city of Tula, with its superb temples and sculptured columns; or Cholula, where archaeologists tunnelled into a steep hill to discover that it was actually the largest pyramid in existence, built more than a thousand years ago.

But the seeds of decay often reside in the midst of triumph, and for reasons only partly known these great cultural centres slowly crumbled to ruin. From the north came hordes of nomadic Nahuatl tribes, lured perhaps by the glitter of former grandeurs. Yet only one of these tribes — the Aztecs — had the inclination and prowess to glean from the collapsing citadels of former glories the ingredients of a new and vigorous civilization. Into the height of its golden age marched Cortéz and his followers in that fateful spring of 1519.

*The heavy shafts of stone that once supported the roof of the Temple of the Columns at Mitla. Below the entrance ways of Mitla's buildings have been discovered numerous elaborate tombs constructed for the burial of High Priests or nobility.*

*Below the telescope's mirror is a bowl of mercury. This acts as the artificial horizon from which the heavenly body's altitude is measured at the moment of observation. Here George Brealey, who designed the instrument, cleans the surface of the mercury by passing a glass rod over it to collect floating scum.*

# The Dominion Observatory's New Star Fixer*

*by* JOHN P. OUGH

Department of Mines and Technical Surveys photographs

A GROUP of Canadian Government astronomers in Ottawa is busy on a project that is being watched closely by other scientists from Leningrad, Russia, to Herstmonceux, England, and around the globe. In a white, cross-shaped building near the Dominion Observatory this group is erecting with extreme precision a revolutionary kind of transit telescope that, by means of a mirror and movable camera, will "stop" the stars in the sky and fix their positions more accurately than was previously possible.

When this new meridian transit is ready in 1960 it will be used to increase man's knowledge of star positions and improve the star charts which are essential to many branches of astronomy, including the study of stellar motions within our galaxy. It is also expected to add to information concerning the wobbling of the earth on its axis and the way the speed of

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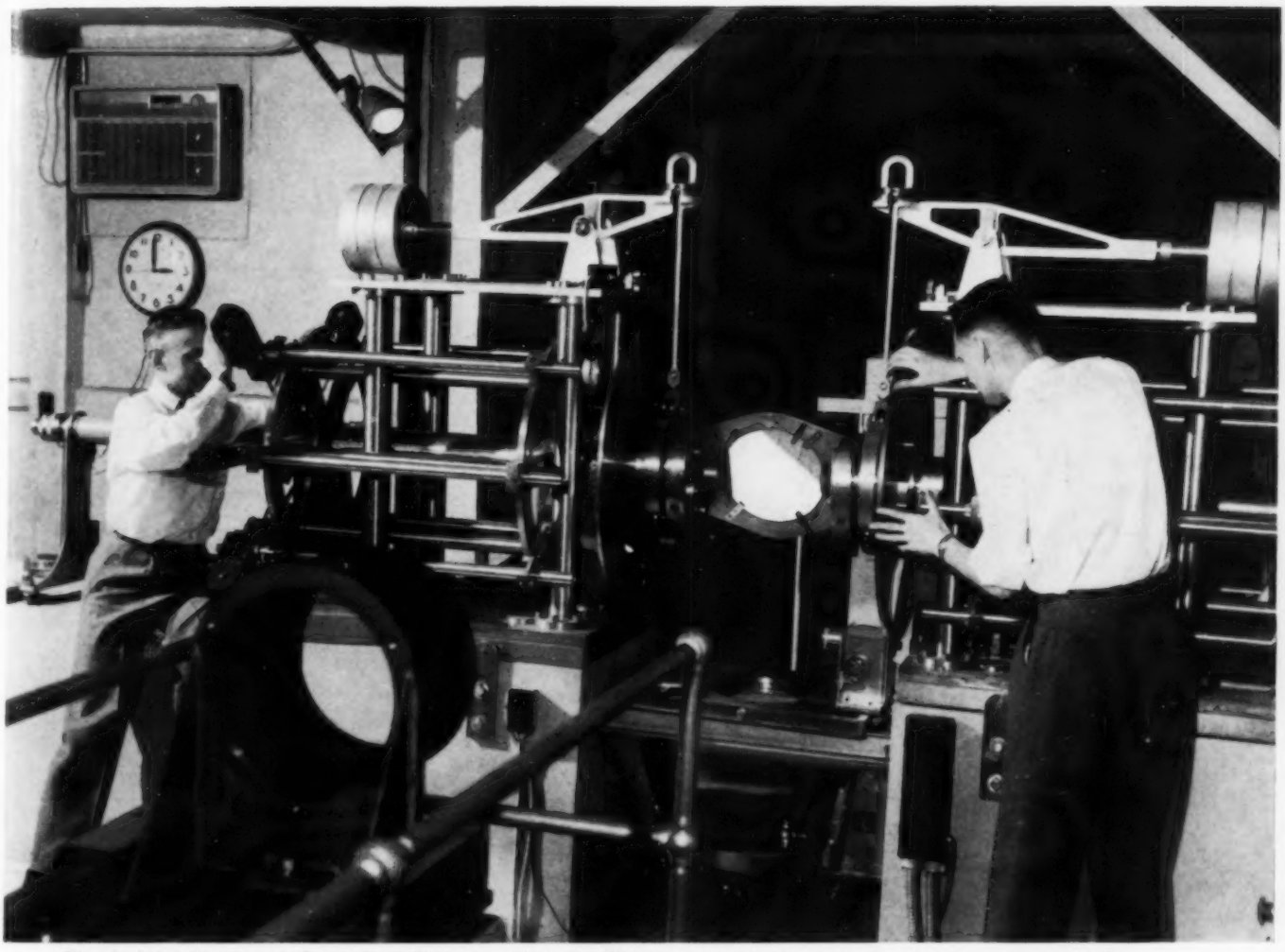


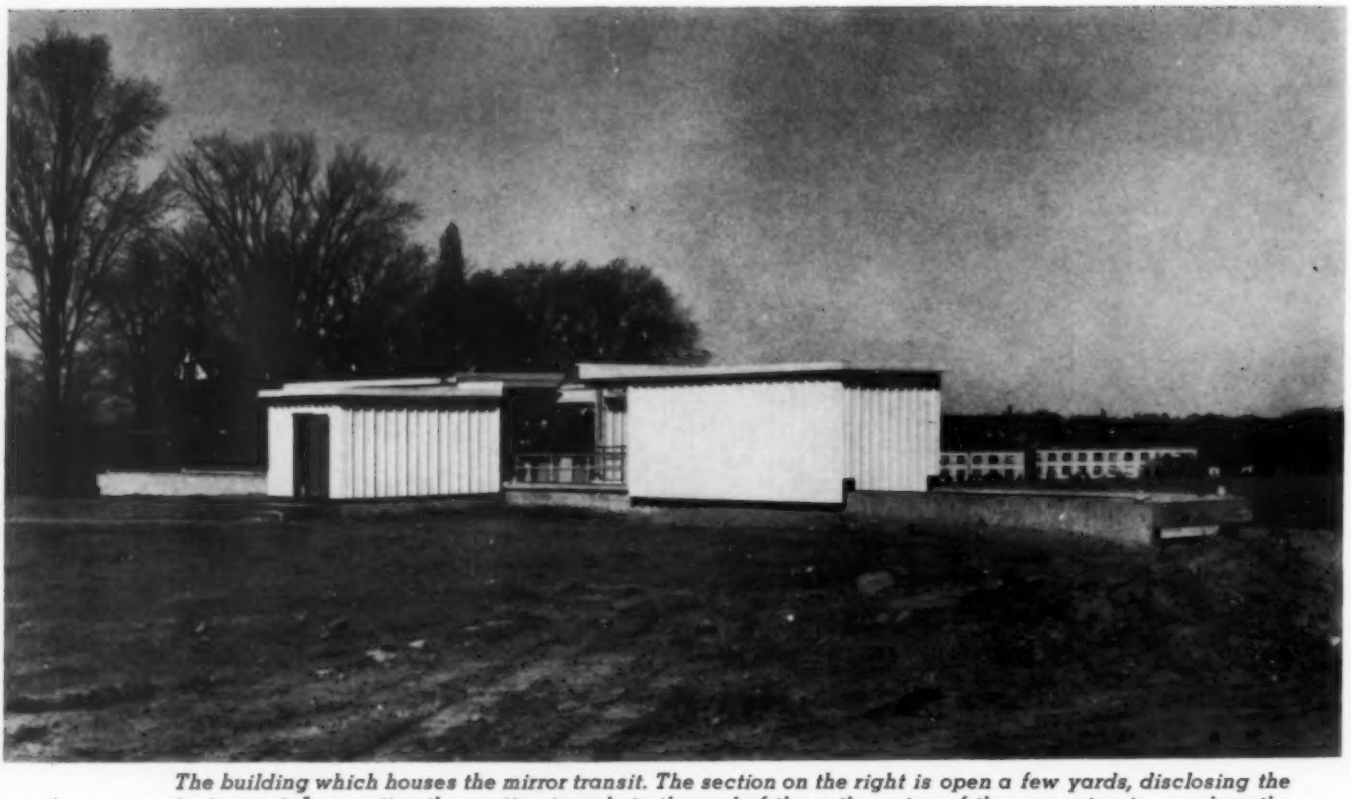
*Chief of the Positional Astronomy Division, Malcolm Thomson, sights through one of the cameras which will record altitude measurements of observed stars. The cameras focus on the minute graduations engraved on the outer rim of the circle at the left of the mirror housing. The mirror itself can be seen at centre, clamped in its solid metal housing, the main weight of which is taken by the two balance arms atop the instrument. George Brealey, at right, turns the whole mirror assembly. In the left foreground can be seen the objective lens of the rigidly mounted telescope, used for observing stars bearing south of the overhead position. A twin telescope on the opposite side of the mirror will be used for stars passing north of the zenith.*

rotation varies. For in this age of rapid progress improved knowledge of the earth's behaviour may at any time become a requirement of the most vital importance.

Mainly responsible for the engineering design of this precision apparatus is George A. Brealey, working under the direction of Malcolm M. Thomson, chief of the Positional Astronomy Division. Other members of the team are Richard W. Tanner and E. Garnet Woolsey, also astronomers of the Department of Mines and Technical Surveys at the Dominion Observatory.

With astronomers the world over extending their researches into every phase of the stars which come within range, it is necessary to know their positions in the heavens, and know them extremely accurately, if they are to be of any use for navigation, surveying, time checking and the intricate problems facing us as we stand on the threshold of space.

Now, in a special building in the grounds of the Dominion Observatory, resting on massive cement piers which are imbedded ten feet into hard clay, a delicate apparatus quite unlike the usual telescope is being assembled. At the press



*The building which houses the mirror transit. The section on the right is open a few yards, disclosing the instrument. In practice the section travels to the end of the rails on top of the concrete pier, as does the opposite section or wing of the building, exposing the meridian from north to south.*

of a button, two wings of the building move back on rails to reveal the open sky.

At the beginning of nightly observations, cameras will record the many readings that ensure an absolute check on the instrument's pointing. By electronic means, a camera connected directly with the time device in the Observatory itself will move across the viewfinder at the exact speed of the star being observed and record it as a dot together with reference marks. This picture will provide a time check or position of the star with an accuracy virtually impossible with usual telescopes.

With this new mirror transit most of the human errors that until now have marred this precision work will be eliminated. No matter how strongly or massively made, the conventional telescope used for positional astronomy always had some amount of "droop" along its length which produced an error difficult to calculate. In cool weather even the heat from the observer's body would distort one end or side of the telescope and produce further errors unless special precautions were taken. These faults, combined with the more human errors which are always present to some extent, have plagued positional astronomers the world over.

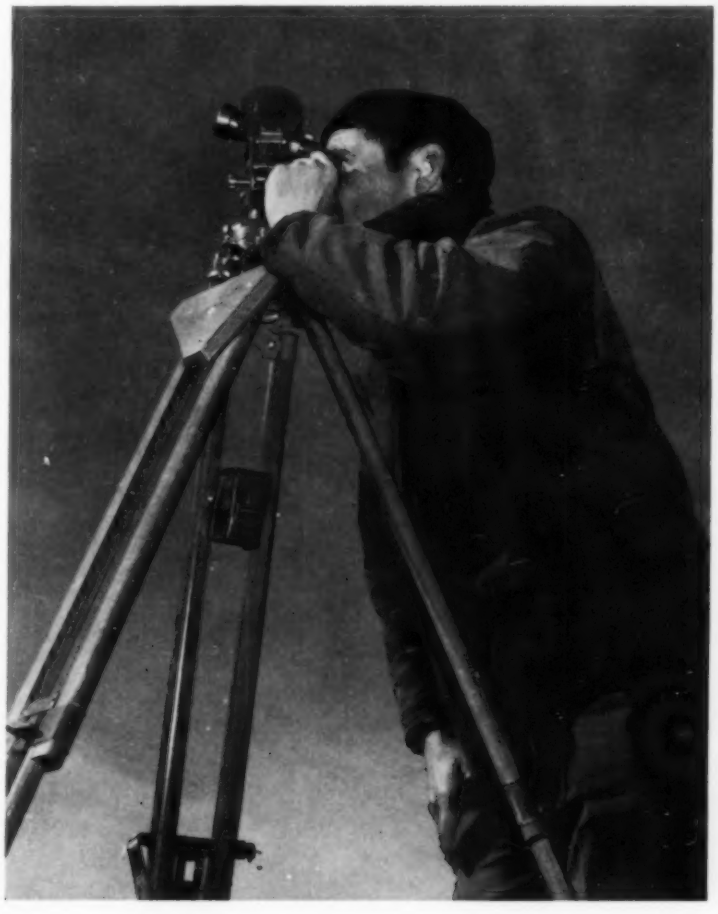
So when Dr. R. d'E. Atkinson of Britain advanced an idea for mounting the telescope horizontally on a rigid foundation and reflecting the stars to it by means of a mirror — thus eliminating these errors — two European countries, Russia and Portugal, commenced experimental work to bring his idea to reality. On the North American continent it was left to Canada and the Dominion Observatory in Ottawa to design and construct this complex instrument — with only the basic principle as a starting point.

Work commenced on the project in 1953 and has progressed rapidly considering the nature of the task. Specially designed at the Dominion Observatory, all the elaborate parts for the instrument had to be made to an unusually high degree of fineness and accuracy; there were no prototypes to go by and most of this work was carried out by Canadian companies.

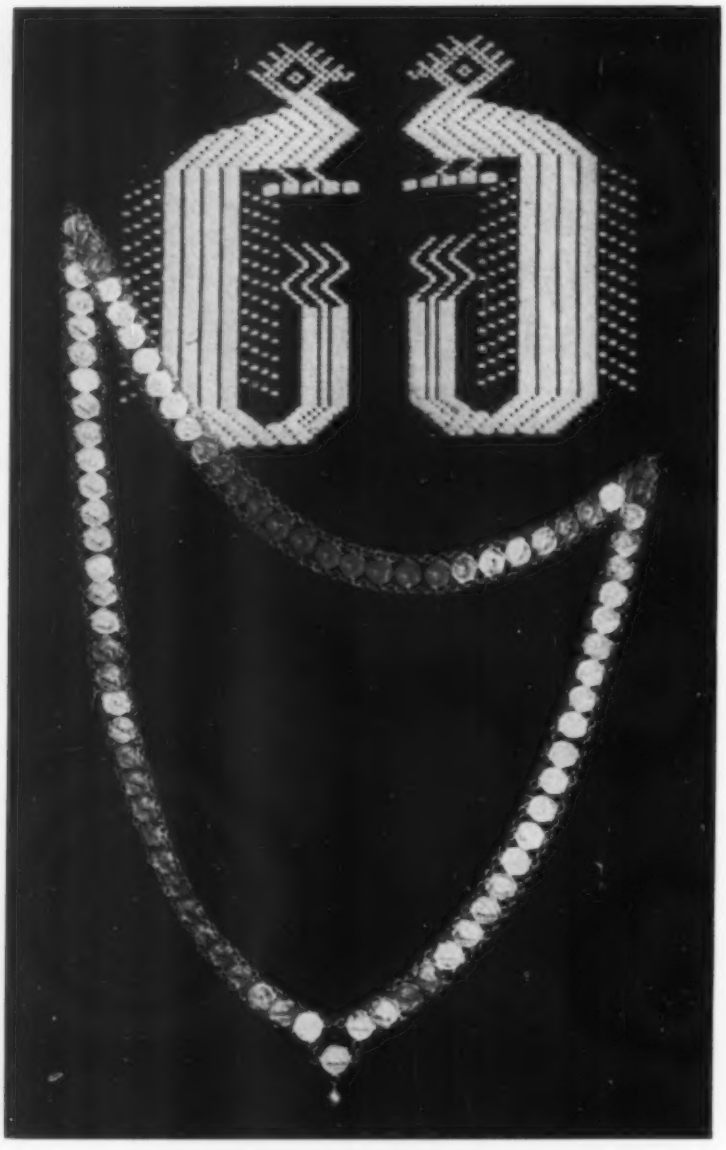
The central axis of steel upon which the reflecting mirror rests weighs 600 pounds and is made from a single piece of metal that was cut down little by little with laborious patience and skill. The bearings of its axis are plain brass buttons, unlubricated because even a light film of oil might cause an inaccuracy in this extremely delicate work. The main weight of this block is supported by two balanced arms or beams to ensure that no bending occurs in its mass and to prevent undue wear on the buttons.

The mirror used for reflecting the stars into the telescope is made from fused quartz with an aluminized surface that is flat to within one-tenth of a wave length of visible light. Round in shape and eleven inches across, the two-inch-thick mirror took six months to make at a cost of over two thousand dollars. Cemented to this main mirror and at right angles on either side are two smaller mirrors which, viewed through two subsidiary telescopes, will disclose any small amount that the axis of the main mirror may wander from its required position and so provide a correction factor.

Just having possession of this modern equipment will assure Canada's being in the forefront of world positional astronomy, but to have designed and built it will be a triumph for the scientists of the Dominion Observatory.



*Improved star positions, which the new transit telescope is expected to furnish with great accuracy, are widely used by surveyors and navigators for establishing geographical positions upon the surface of the earth. Here a surveyor takes observations of Polaris with a delicate theodolite which reads angles to decimals of a second of arc. Such high order work demands precise standards of positional astronomy.*



*The Guatemalan wedding chain is found only in Cobán, and here it appears in many different forms. It may be a simple chain, or it may be like this one, carved circles of silver set between two more chains. Behind it is hand-woven Guatemalan cloth, embroidered with two quetzal birds.*

# Guatemalan Wedding Chain

by ADELAIDE LEITCH

Photographs by the author

A FORTUNE in hand-made silver hangs around the neck of every married woman in Cobán, mountain-girded village of the Guatemalan Highlands.

Handed down from generation to generation, or bought in the Indian market alongside the guavas, mangoes, and *frijoles*, these "Wedding Chains of Guatemala" are exquisite in workmanship — and a traditional measure of the husband's importance!

When two people marry in Cobán, the wedding chain goes over the heads of both bride and groom, symbolically linking them together inside a circle of pure silver. But, the ceremony over, it is she who wears the silver chain. And she wears it everywhere: sitting in the native market selling live chickens or iguanas, walking barefoot to the stream to do her washing, nursing her newest black-eyed baby. She bends over steaming black pots set on open fires, with yards of hand-wrought silver swinging back and forth in steam scented with garlic,

maize or mutton. Sometimes there is a "clunk!" of silver on a blackened tortilla griddle, sometimes the wedding chain is entangled in the corn with which she is filling her *rebozo*, or shawl.

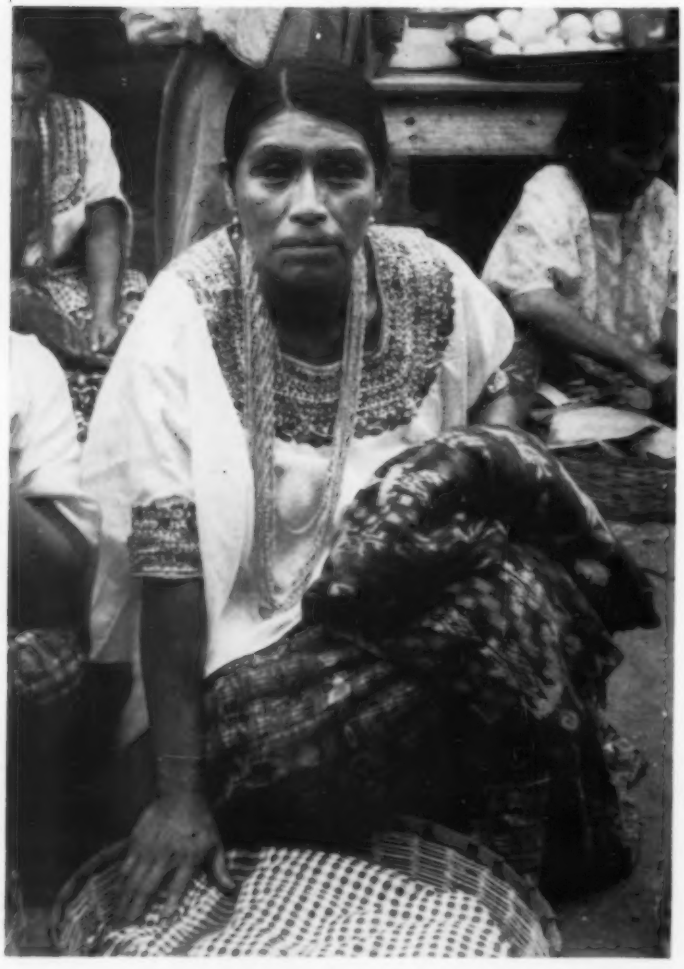
A young bride may have only one simple chain hanging over her embroidered *huipil*, or native blouse. An older matron may have several, and the more chains she wears the more prestige falls to her husband, who may have spent more *quetzales* than he should in buying them.

Whatever its design, the wedding chain identifies the woman of Cobán. And the designs are as varied as the imaginations of the silversmiths who have made them. Some chains are slim, sinuous and several yards long, intended to be looped many times around the wearer's neck; they may be made of tiny silver rings, patiently joined together by hand. Other chains are made of small circles of silver, carved with suns, stars or Guatemalan volcanoes, sometimes linked together with double strands of simple chains. They can also be decorated with silver balls, crosses, or even tiny figures of animals.

You can still find wedding chains made out of silver *reales*, once the coinage of Spain. When the Spanish monetary system changed and Guatemala took a coin of its own, the *quetzal* — a coin named for a rare, beautiful bird that cannot live in captivity — the old Spanish coins were offered for sale cheap. The Indians, not just of Cobán but of many villages bought them by the bagful to use in their own jewelry. In some villages, even today, you can find rings set with Spanish *reales* offered for sale among inexpensive baubles.

The Guatemalan Indian loves the bright and the sparkling and is considered one of the most

*Two young women of Cobán relax on a convenient doorstep. The wedding chain, the loose* huipil *and the type of weaving in the skirt identify the women of Cobán. Blue and green are favourite skirt colours here; the pattern is often tartan-like.*



*Her husband has much prestige in the village, because many wedding chains hang down the front of his wife's richly-embroidered* huipil.

colourful Indians in the world. In this high land of volcanoes and sky-climbing mountains, every village is a separate, closely-knit group differing from other villages. There are over 280 different costumes and no two are alike. The trade mark of the woman of Santiago Atitlán is an intricate, halo-like head-dress. In Chichicastenango, the woman's *huipil* is embroidered in wool petit point in a dozen brilliant colours; her modest, hand-loomed blue skirt is decorated with a vivid, embroidered cross, one arm of which encircles her hips. One village may choose a satin *huipil*; another may wear a sheer, loose-flowing cotton. A skirt may be fastened, traditionally, by a long broad belt which, passing several times around the waist, tells in transit a complete woven history of the wearer's Mayan ancestors.

Blue, red, purple, orange, mix with abandon and considerable genius in Guatemala. Every

*Above:—*
*Her wedding chain swinging, a Cobán woman goes marketing for the day's groceries.*

market is aflutter with ribbons, some of them six inches wide. These are woven into long, black braids, often terminating in a gigantic bow. The sparkle in the ears may be from inexpensive ear-rings sold by the hundred in the native markets; or the ear-rings may be of pure gold, of silver filigree or priceless jade, worked by an unknown and, perhaps, long-dead artist in a tile-roofed shack in the hills.

Although the man's dress often shows a Spanish influence, and often a pure North American one as well, the Guatemalan woman's dress is pure pre-conquest Indian. The women do not trade styles from village to village, although they visit on market and some fiesta days. If a girl of one village marries a man of another, she changes to the costume of his people — the change of dress often being effected at the edge of town. If she is marrying into Cobán, she will begin collecting wedding chains. But if she is a Cobán girl marrying outside her village, she will not usually wear the jewelry of Cobán over the costume of another group.

Only in Cobán, do you find the lovely tradition of the Guatemalan wedding chain.

*Right:—*
*A Cobán mother cuddles her black-eyed youngster who, at any minute, may make a grab for "pretty silver" around the mother's neck.*

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W. J. Mackey (*The Scale Model — Oracle of the Hydraulics Engineer*) is in the public relations section of the National Research Council, Ottawa. He was previously associated with provincial research organizations in Toronto.

* * *

Vera Fidler (*The Odd Will of Peter Fidler*) was raised in Alberta and lived there until 1942 when she was married and moved to Ottawa. Her husband (no relation to Peter Fidler) is a descendant of a pioneer family who settled in Alberta. Mrs. Fidler has been writing for a number of years, has had one novel published, and has contributed articles and fiction to Canadian, U.S. and British publications.

* * *

Charles Gallenkamp (*The Cities of Ancient Mexico*) has carried out research in Mexican archaeology and ethnology since 1950. He has been leader of several archaeological expeditions in the United States Southwest, Mexico and Central America. Recently he has been directing the work of the Mayan Research Fund of the Interam Foundation, Inc., at Denton, Texas. His book, *Maya: The Riddle and Rediscovery of a Lost Civilization*, has just been published by David McKay Company, New York.

* * *

John P. Ough (*The Dominion Observatory's New Star Fixer*) is in the Editorial and Information Division of the federal Department of Mines and Technical Surveys at Ottawa.

* * *

Adelaide Leitch (*Guatemalan Wedding Chain*) is a freelance photographer-writer from Ottawa, whose work has appeared frequently in these pages.

**The Ice Was All Between**
*by T. A. Irvine*
Longmans, Green and Company, Toronto. 216 pp. $4.50)

Although relatively young in years, Commander Irvine has gained a wealth of experience at sea, through service in the Royal Navy, Merchant Navy and the Royal Canadian Navy and this experience is readily reflected in his book.

After reading his story of the *Labrador*'s continent circling maiden voyage, one is impressed by the thought that this naval officer is not only well qualified as a seaman, but equally qualified as a writer. In my opinion, this book which is based on fact with real characters, compares favourably with the best sea stories written by Forester and Marryat. It is fascinating and depicts with great accuracy and simplicity the true character of the Arctic, and contains that element of human interest which is so important in the making of a truly good story.

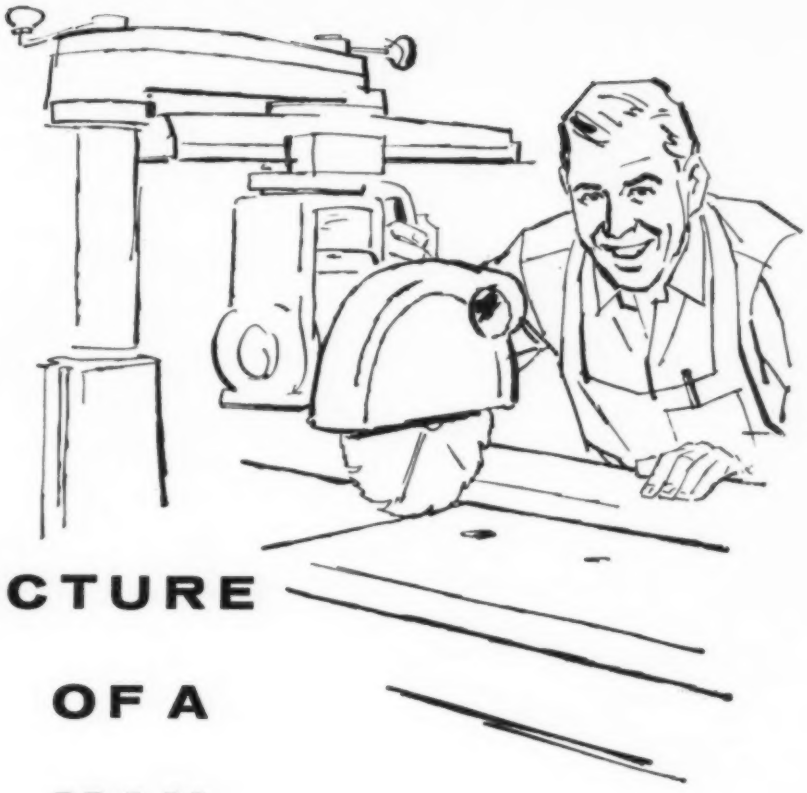
The author's power of observation, understanding of human nature, knowledge of the sea, and descriptive talent as a writer have been combined to produce a story so real the reader feels that he is a part of it. One can almost hear the roar of the powerful engines and feel the shudder and vibration of the ship as she batters and crashes her way through the heavy ice.

Having some knowledge of the Arctic myself, I can well appreciate the worries and responsibilities which were the lot of Captain Robertson when he set off from Halifax with a new, expensive, virtually untested ship and with a crew whose experience in the Arctic and ice was practically nil. However, after personally meeting most of the officers and men just prior to their departure, I felt confident that they would succeed in their mission and would through courage, determination, and *esprit de corps* uphold the standards and traditions set by personnel of British Navy ships, who in years gone by gave so much to the cause of exploration in the Arctic.

A journey by sea from Halifax to Vancouver via the Northwest Passage, thence back to Halifax by way of the Panama Canal in one season is an achievement of considerable magnitude even in this day and age of power, and I have no doubt that persons in all walks of life, both young and old, will find this book not only very interesting but also very informative.

I really cannot conclude this re-

(*Continued on page VII*)

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(*Continued from page VI*)

view without making reference to the humorous incidents which occurred at Esquimalt and San Francisco involving two or three of the sailors from the *Labrador*. These men are typical of the old type, good natured, lovable sailors whose dependability and worth while aboard ship is beyond reproach, but whose release from any long and gruelling sea voyage comes with a bang and usually results in awkward and embarrassing situations which really never result in any great harm.

The Navy should be very proud of Commander Irvine because he has upheld the best traditions of the Royal Navy and the Royal Canadian Navy in the accomplishment of this fine book. I cannot find fault with it in any respect. The fact that he has given credit to other Arctic explorers, both past and present, has not gone unnoticed and this expression of unselfishness not only enhances the value of his book, but it also reflects the integrity of the man who wrote it.

H. A. LARSEN

*Superintendent Larsen made the first voyage through the Northwest Passage to be completed in a single year (1944). In 1959 he was named the first recipient of the Massey Medal of The Royal Canadian Geographical Society.*

* * *

**Malaya, Indonesia, Borneo and the Philippines**

*by Charles Robequain, translated by E. D. Laborde*

(Longmans, Green and Company, Toronto. 466 pp. $7.55)

Monsieur Robequain has woven a truly magnificent and interesting geographical portrait of this tropical realm in which the reader is made aware of a sense of unity throughout each of the twenty-four chapters.

The first six chapters in Part One are devoted to a description of the general features, leading very naturally from "Discovery and Partition" to "Land and Sea", "Climate", "Vegetation and Fauna", "The Peoples and their Civilisation", and "Distribution of Population; Modes of Life". Thus we find Western peoples in the Malay world early in the sixteenth century although Sumatra had been visited by the immortal Marco Polo two hundred years before (1292). In the ensuing years, merchants, travellers, colonizers and clergymen succeeded in making varying degrees of impressions in this not too receptive territory. Of the different nationalities that have established a foothold in the Malay world, the most outstand-

(*Continued on page IX*)

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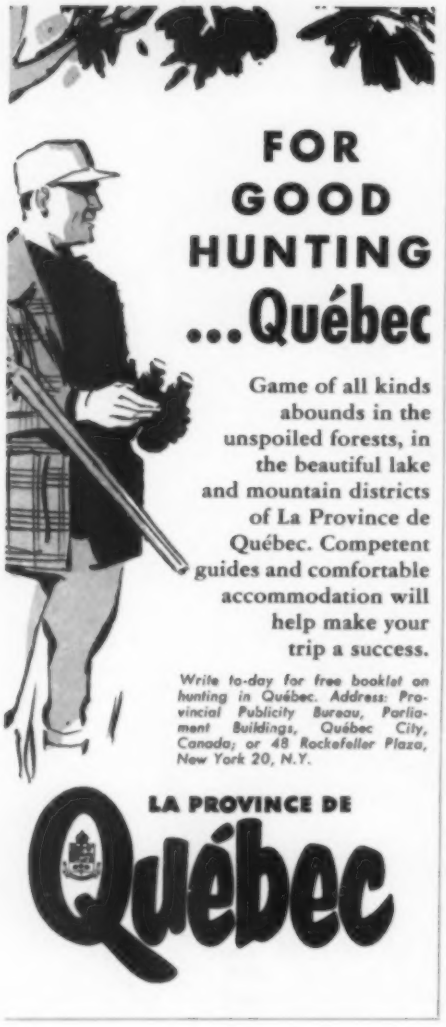
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LA PROVINCE DE
Québec

*(Continued from page VII)*

ing, numerically and otherwise, is the Chinese. As Robequain very aptly describes him, "The Chinese is not a harmful weed." The Chinaman is labelled enterprising; he is adept in the art of usury, though he is not considered usurious by nature. He is seen in his greatest role as the middleman, but he is not reluctant to stoop to the most menial of chores when necessary, nor does he back down when he has occasion to clash with those in power. If the three most important cultural factors contributing to the economic development of the Malay world could be listed, Chinese industriousness would rank first over either the introduction of the efficient system of irrigation by the Dutch, or the various beliefs absorbed by the peoples from numerous religious organizations. Each has been highly significant in this evolution: the Chinese as astute entrepreneurs and middlemen; the cleverly engineered system of irrigated terraces has alleviated famine and aided in opening virgin areas for exotic transplants; last, but not least, the pacifying and stabilizing influence of the Church has allowed entry into formerly restricted and hostile areas.

The second part of the book, chapters VII-XIII, deals with specific regions, namely Malaya, Sumatra, Java, Borneo, Celebes, Eastern Indonesia and the Philippines. While the discussion of Borneo and Celebes seems a little too abbreviated, and the chapters for Java and the Philippines too drawn out, they are generally good and perhaps in this manner give a more realistic approach to their actual weight in the economic structure. Each chapter has good vicinal maps of the area in question, and for this particular publication, the idea of a regional map inside the front and back covers is to be commended. The photographs are ample throughout and quite representative.

The third part of the text, involving chapters XIV-XIX, is concerned with colonialism and its economic effect under the headings: "Population and Exports", "The Region Opened to World Trade", "Economic Systems", "Plantations and Scientific Agriculture", "Development of Peasant Agriculture", and "The Problem of Industrialisation". The fourth part, covered in chapters XX-XXIV, is concerned with colonial achievement under headings "Social and Cultural Achievements", "Medical Attention and Hygiene", "Christian Missions", "Education" and "Political Development". In his concluding postscript the author discusses political emancipation, production and commerce, economic future, and the problem of population. The bibliography is a well categorized listing of 253 entries.

Although the reviewer congratulates Monsieur Robequain for his versatility in producing an excellent geographical treatise, there is space for constructive criticism. Much of the numerical data concerning populations, workers engaged in industry, and so on, refers to the 1930s with few comparative figures in the present decade. He does make some attempt to remedy this in a later chapter, but the damage has already been done, for the reader is left wondering what has transpired in the interim. Thus the island of Sumatra is carried very well through the year 1941 but appears to have remained static through the war years to the present — a noticeable gap of eighteen years.

Dr. E. D. Laborde has done a good job in translating this work with only minor points for contention. In some paragraphs, whether due to translation difficulties or inherent in the original manuscript, the text is apt to confuse the reader in regard to time; for example, it is not always clear whether the discussion is in the present or past. There are minor discrepancies also in past participle and misspelling on one map. Finally there would seem to be a definite need for some sort of glossary since much of the text is devoted to native, foreign and scientific terminology.

S. C. Wiley

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* * *

**Spring on an Arctic Island**
*by Katherine Scherman*
(Little, Brown and Company, Toronto. $5.50)

Mrs. Scherman has had the good fortune, unusual for a woman, to take part in an expedition to the Arctic. A journalist and amateur ornithologist she spent six weeks on the south coast of Bylot Island and around Pond Inlet, with her husband and a party of scientists, including one other woman. The book is the result of this her only experience of the Arctic, and it is to her credit that it is as good as it is. She has managed to convey her

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own slightly astonished enthusiasm for the beautiful mountain region and its inhabitants, both Eskimo and white, and perhaps because she is a woman, she notices and finds it worth while to record many small details of day-to-day camp life and travel routine which do not usually appear in print and are all the more interesting and refreshing for that reason. Sledge travel, seal hunting, and salmon fishing, as well as bird-watching and life at the settlement of Pond Inlet, are all described in a style that is easy to read, and the book also contains a number of Eskimo folk tales, recounted or translated for the author by Pete Murdoch, the Hudson's Bay Company manager. The local residents figure largely in her pages, particularly Idlouk, the leading hunter at Pond Inlet (now moved to Resolute Bay), who must be the most written-about Eskimo in the Canadian Arctic, being already well known to readers of Douglas Wilkinson's *Land of the Long Day*.

Mrs. Scherman has much to recount that is within her own experiences, and her very readable book would have been better if she had let it go at that. Unfortunately, however, she has inserted many passages of general. information on the history, geography, and natural history of the area, and much of this material is shaky in the extreme. To pick a few random examples: she misplaces the whaling period by exactly one century — it ended in the early twentieth century, not the nineteenth, and there was no hundred-year break in the history of white contact with the natives of Pond Inlet; Pat Baird crossed the corner of Bylot Island in 1939, not "three years ago"; twenty Coronation Medals, not two, were awarded to Eskimos; and the art of carving is an original native form of expression, encouraged but not planted by the white man. It seems a pity to have marred a pleasant book by this sort of superficial and inaccurate writing, which springs from lack of knowledge and, one suspects, from a rather naïve and uncritical acceptance of the unchecked statements of the local residents. Incidentally, if Pete Murdoch really told Mrs. Scherman she was the first white woman he had seen in five years, he was exaggerating greatly. Only a few weeks before, the settlement had been visited by Mrs. Diana Rowley on a flight from Churchill; the C.G.S. *C. D. Howe*, calling every summer, almost always has women aboard; a year or two earlier Mrs. Douglas Wilkinson spent several months at Pond Inlet with her husband on an assignment for the National Film Board; and the

(*Continued on page XI*)

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(*Continued from page X*)

recently replaced Anglican missionar was a married man.

Finally a word for the map-maker When will journalistic writers ceas the indiscriminate use of the adjectiv "unmapped" in describing any par of the Arctic? Admittedly there i still room for much refinement an improvement in the map of the Pon Inlet area, and the largest scale avail able is eight miles to one inch, but i is nevertheless a good map, draw from air photographs and showin considerable topographic detail n only on the coast but in the "un charted" interior. Even the artist' version, which forms the attractiv end-papers of this well-produced an illustrated book, gives plenty of in formation, and if Mrs. Scherma would compare it with the pre-195 edition she would strike out all th unmappeds and uncharteds that ar sprinkled so liberally around th opening chapters of her book.

MOIRA DUNBA

*Miss Moira Dunbar is in the Geo physics Section of the Defence Researc Board. She specializes in the study o aerial photographs of the Canadia Arctic regions.*

* * *

**The Encyclopedia Canadiana (Volumes 2, 3 and 4)**

*Edited by John E. Robbins*

(The Canadiana Company Limited Ottawa, $129.50 set of ten volumes

A fair inkling of the shape an character of the *Canadiana* was pro vided by Volume 1, reviewed in th May 1958 issue of the *Canadian Geo graphical Journal*. These next thre volumes bear out the favourable im pression of the first. In 1,260 pages they take us from the Blue birch t the Governor General, covering wonderful diversity of subjects e route. I now know that Flin Flo derives its name from the fictiona Josiah Flintabbatey Flonatin, tha the "most popular participatio sport" in Canada is bowling, and tha a professional witch hunter name Dr. John Troyer once lived in south ern Ontario (see under "Ghost Sto ries"). Even Paul Bunyan gets a entry — a considerably bigger one incidentally, than Joseph Brant.

Among graver matters, it is goo to find the British North Americ Act given in full, with amendments The "C" section embraces the tw great railway systems that loom s large in the country's economy an structure; and both are treated wit thoroughness. Things geographica come under four headings, which are in effect: place naming, societies

hysical features and education; these cupy twelve and a half pages, and here is an additional sixteen-page in- rt of coloured plates forming a epresentative sample of the whole anadian scene. (The excellent il- strated article on cartography can lso of course be included as part of eography.) Two pieces that I read ith appreciation are those on the rench and English languages as used n Canada. I am glad to find a low pinion of Canadian writing expressed – not that I agree, but it is satisfying o note this evidence that the con- ributor felt under no obligation to atter.

If, at this stage of the publication, were pressed to criticize something, would say that I am beginning to hink there is a surfeit of illustrations. ome of the photographs are clichés – and not even specifically Canadian. here are, for instance, too many hots typified by that of a scientist, otebook and pencil at the ready, azing anxiously at glassware. There s a study of three (*sic*) old men play- g chess, which could remotely have een justified in illustration of welfare r some such but which does not real- , as is presumably hoped, add any- hing to the article on "Chess". Such casional lapses contrast sharply ith, say, the fine set of twenty-three photographs, all new to me, of Eskimo life, in volume four.

N. T. GRIDGEMAN

*Mr. N. T. Gridgeman is statistician to the Division of Applied Biology at the National Research of Council. He has made a special study of vitamins.*

* * *

**Amor De Cosmos**
*by Roland Wild*
(The Ryerson Press, Toronto.
146 pp. $4.00)

There is a dearth of good biographies of noted Canadians and those interested in Canadian history welcome warmly each announcement that a book has appeared to help fill the gaps. The subject of this little book merits a biography for he was one of the more interesting of British Columbia's long line of colourful politicians.

It is a pity that this book is not what it claims to be. It is not "an outstanding biography of the second premier of the province of British Columbia" nor is it the story of "the man who was chiefly responsible for British Columbia's coming into Confederation"; it is merely the story of Amor De Cosmos, the newspaper man and editor of the *Colonist*. De Cosmos' political career is given scant attention; the story of his premiership is covered in six pages, and of his relations with Governors Kennedy, Seymour and Musgrave there is no mention. Many of the most live political issues of the day in most of which De Cosmos must have played a major part are not treated. Some of these are: the union of the island and the mainland, the intense rivalry between New Westminster (Queensborough) and Victoria, the fight for responsible government in the colony, and the chronic financial difficulties of the colony and the province. Even the long, involved and bitter controversies about union with Canada in which De Cosmos was a leading actor are slipped over in the most perfunctory manner.

There is little evidence here of research or of the help which the author received from three archives, five libraries and a historical society. The book has no index, no bibliography and no source notes. The introductory chapters are instructive and well written but some of the later chapters are merely conglomerations of anecdotes liberally stuffed with quotations from the *Colonist*.

A. M. WILLMS

*Mr. A. M. Willms is Chief of the Public Archives Records Centre at Ottawa.*

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### Climbs and Ski Runs
*by Frank S. Smythe*

(The Macmillan Company of Canada Limited, Toronto. $3.00)

Frank Smythe died in 1949. He was a great mountaineer and is especially remembered in Canada for his book *Climbs in the Canadian Rockies* (Hodder and Stoughton, London, 1950) and for his 1947 expedition to the Lloyd George Mountains of north-eastern British Columbia, described in that book.

A first edition of the present book appeared at the outset of his career, before he became famous as the conqueror of Kamet and as a member of the 1933 expedition to Everest, where his climbing record was second to none. Surprisingly he was not very strong physically; indeed this book was written soon after he was invalided from the Royal Air Force.

Smythe was at his best describing mountain adventure, and the present book includes, with historical background, vivid accounts of rock-climbing in Wales, Yorkshire and the Lake District; of a ski-tour in Austria; of spring climbing in Corsica; and finally of some of the classic climbs in the Alps — the east face of the Aiguille du Plan, the Pétéret Ridge and, on the Brenva face of Mont Blanc, the Red Sentinel Route and Route Major. The last two climbs were first ascents with Professor T. Graham Brown and both involved bivouacs. There is a useful chapter on avalanches and speculation on the mysterious "green ray" sunrise, precursor of bad weather in the Alps. Inevitably the book has dated, as many new climbs have been done and many first ascents repeated more than once since 1929. The nine photographs by the author are, with a few exceptions, poorly reproduced and do scant justice to a very skilful mountain photographer. Smythe had a special ability to convey his passion for mountains to a wide variety of people who had never climbed. The feelings aroused in him by mountains were very genuine, but his philosophizing falls short of the original or the profound.

As an all-round mountaineer who knew the mountains at all seasons — on rock, on ice, on skis — Smythe's record was unsurpassed. As the late Geoffrey Winthrop Young wrote in his charming foreword, "he if any one could give us the wider view, not only of the mountains themselves, but of all the varied possibilities of mountaineering adventure." A fitting epitaph upon one great mountaineer by another.

G. HATTERSLEY-SMITH

### Richard Hakluyt — Voyages and Documents
*Selected by Janet Hampden*

(Oxford University Press, Toronto. 471 pp. $1.75)

Richard Hakluyt was an ordained clergyman of sixteenth-century England. The wonderful voyages and adventures in which seamen and adventurers were involved during his lifetime so fascinated him that he began to collect, translate, and publish accounts of navigation and discovery. In 1589 he brought out *The Principal Navigations, Voiages, Traffiques and Discoveries of the English Nation*, including narratives from periods not covered by his life span. Nine years later, he started bringing out a second edition, this one more than twice as long and running to three volumes. After it was completed, in 1600, he did not do much more publishing, but he continued to hunt down stories of important sea voyages and explorations. Today a complete edition of his *Principal Navigations* runs to twelve volumes.

Now Janet Hampden has performed a great service by selecting the most important and interesting works from Hakluyt's collection, and Oxford has published them in one pocket-sized edition. Here are hours and hours of fascinating reading, and one gets a picture of life on the sea in the sixteenth century, a look at some of the famous men of the time, and a sketch of English and world history. Such historically famous personages as Cabot, Drake, Frobisher, and Hawkins are here, but there are also men such as Bodenham, Jenkinson and Stevens who are not so well known. The voyages of Cabot, Frobisher, Gilbert and Davis to Canadian waters and in search of the Northwest Passage will be of special interest to North American readers so the book will be and deserves to be widely popular in Canada.

Miss Hampden has seen fit to keep the original spellings, which, while preserving the authentic flavour of the accounts, makes the reading slower. The smallness of the print also has its drawbacks, but it is necessary in order to get so much valuable and interesting material into a book that one can carry about easily. A glossary of unfamiliar and nautical terms and an index make the volume readily usable as a reference work, and a chronology of events of the sixteenth century helps one to fit the accounts into their proper perspective.

CHARLES PAUL MAY

*Mr. May works in the Editorial Department of The Book of Knowledge, New York.*